

BULLETIN OF MISCELLANEOUS INFORMATION Appendix 1938 ROYAL BOTANIC GARDENS, KEW

REVIEW OF THE WORK OF THE ROYAL BOTANIC GARDENS, KEW, DURING 1938

General

STAFF.—Mr. H. C. SAMPSON, C.I.E., retired from the post of Economic Botanist on September 30th, 1938. Sir GEOFFREY EVANS, C.I.E., Principal of the Imperial College of Tropical Agriculture, Trinidad, was appointed to succeed him (K.B. 1938, 250).

Dr. H. G. SCHWEICKERDT, who has held the post of Botanist for South Africa since 1934, returned to South Africa as Professional Officer (Botany), Division of Plant Industry, Department of Agriculture, Pretoria. He has been succeeded by Mr. D. G. COLLETT, B.Sc., Assistant Professional Officer (Botany) in the same Department, who commenced his duties on September 24th, 1938.

THE DIRECTOR was elected to the Ripon Professorship of the Indian Association for the Cultivation of Science for the year 1938, and delivered a course of three lectures in Calcutta in January, 1938.

THE DIRECTOR was elected an Honorary Fellow of the Botanical Society of Edinburgh.

Mr. A. D. COTTON, Keeper of the Herbarium and Library, was elected a corresponding member of the Botanical Society of Czechoslovakia.

OFFICIAL VISITS AND JOURNEYS.—THE DIRECTOR attended the 25th Annual Meeting of the Indian Science Congress at Calcutta from January 3rd to January 9th, 1938, as recorded in the Annual Report for 1937, 531.

He reached Calcutta from Darjeeling on January 2nd at 8 a.m. and was fully engaged during the week attending the various meetings connected with the Congress.

The meeting was opened by His Excellency the Viceroy, the Most Hon. the Marquess of Linlithgow, P.C., in a large marquee erected in the grounds of the University College of Science, the members of the British Association Delegation and the Indian scientists wearing their academic robes.

During the week the Director read a paper on "The Seedling Structure of the Gesneriaceae" before the botanical section of the Congress and took part in discussions on papers presented to the section. He also broadcast an address on the Royal Botanic Gardens, Kew, and its connexion with India, and addressed the annual meeting of the Indian Botanical Society.

The Director attended the 150th Anniversary Meeting of the Royal Botanic Gardens, Sibpur, presided over by the Nawab Bahadur of Dacca, Minister for Industries and Agriculture, Bengal, and made the following speech :—

“ Honourable Nawab Bahadur, Ladies and Gentlemen.

“ It is singularly appropriate that the 150th Anniversary of the Foundation of the Royal Botanic Gardens, Sibpur, should coincide with the Jubilee Meeting of the Indian Science Congress at Calcutta, which is being attended by so many distinguished delegates from Great Britain, many of whom, including the President, we are honoured in having with us this afternoon. We all join in offering our good wishes for the continued prosperity of the Garden and look back with respectful admiration to its record of valuable work under its distinguished Superintendents during the past 150 years.

“ I feel particularly fortunate in being present here with you to-day, as it is the first time a Director of the Royal Botanic Gardens, Kew, has been in India in his official capacity. It is also of special interest to me personally, since my predecessor in office at Kew, Sir David Prain, held with distinction for many years the post of Superintendent of these Gardens and the Directorship of the Botanical Survey of India.

“ Your Gardens here offer an interesting and remarkable parallel to those other Royal Gardens under my charge at Kew, since Kew, on the banks of the River Thames, is only a few miles from London, while your Sibpur Gardens are within easy distance of the second city of the Empire and are situated on the banks of the Hooghly, which washes the shores of Calcutta. Both our Gardens suffer somewhat from being on the flat alluvial soil of the riverside ; the skill of the gardener, however, has transformed both sites into Gardens of high scientific interest as well as of great aesthetic beauty, so that they serve as a source of inspiration, education and research for their many visitors. May they find in them both spiritual rest and refreshment and also that tree whose leaves were ‘for the healing of the Nations.’ Then again you justly treasure in this garden your renowned Herbarium, which is in fact the National Herbarium of India and is the Mecca for the study of Indian systematic botany by botanists, not only in India but from overseas, affording yet another point of similarity with Kew ; for our great National Herbarium at Kew is the centre for the study of systematic botany both for India and for the Empire.

“ I earnestly hope that the Government of Bengal will continue to realise the importance of these famous Sibpur Gardens and that the necessary funds will be forthcoming both for the maintenance of the scientific staff and for the proper upkeep of the living collections.

“ These Gardens, I would suggest, should, as one of their functions, serve, like Kew, as a training ground for student

gardeners, in order that the many good gardens and parks in India may be maintained at a high standard of excellence in the future by Indian gardeners trained at Sibpur. As you know, Sibpur, almost since its inception, has been tended and improved by student gardeners sent out from the Royal Botanic Gardens, Kew, many of whose names are remembered with honour in the roll of Indian Horticulture and whose fine work remains as their permanent memorial. This custom, which has resulted in so much benefit to Indian horticulture, I hope may be continued in the future. With one or two men sent out from Kew to Calcutta as Instructors or Curators, there should be no difficulty in establishing at the Royal Botanic Gardens, Sibpur, a 'school' for the training of Indian student gardeners for service in various parts of India, so that the great traditions of the past may be adequately continued.

"Honourable Nawab Bahadur, Ladies and Gentlemen, on behalf of the more youthful Royal Botanic Gardens, Kew, which have not yet reached the 100th year of their existence as a public institution, I beg leave to offer our cordial good wishes for the continued prosperity and enhanced usefulness of the Royal Botanic Gardens, Calcutta."

A discussion was arranged on "A National Herbarium for India" in the Botanical Section of the Association in co-operation with the Botanical Society, in which the Director took part, the outcome of which was the appointment of a committee of which he was elected a member. This committee has since submitted a report, which has been presented to the Government of India, recommending the recognition of the Herbarium at Sibpur as the National Herbarium and other important matters relating to the encouragement of research in systematic botany.

As the Director had been appointed the Ripon Professor in the Indian Association for the Cultivation of Science it was his duty to deliver three lectures before the members of the Association in Calcutta during the week of the Congress. The first of these lectures related to the history and functions of botanic gardens and to Kew's connexion with India in particular, while the other two dealt with matters connected with seedling structure and the germination of certain abnormal types of seed. The lectures* have now been published with illustrations.

During the week in Calcutta the Director visited on more than one occasion the Royal Botanic Garden and the Herbarium under the guidance of Dr. K. Biswas; the Indian Science Museum with its fine economic collections which were ably demonstrated by Dr. S. N. Bal, and other scientific institutions in Calcutta. A visit was paid to the Gardens at Government House, Barrackpore, now in charge of Mr. A. P. Lancaster who was a student gardener

* The Indian Association for the Cultivation of Science, Special Publication No. 8. Calcutta, 1939. Price 2s.

at Kew. He also saw Mr. A. S. Wilson, formerly Assistant Curator at Kew, who is now head gardener to the Maharajah of Cooch Behar.

At the close of the Congress the Director bade farewell to the other members of the British Association Delegation and proceeded to Puri, where he was the guest of His Excellency the Governor of Orissa, Sir John Hubback, K.C.S.I. North of Puri the extensive, sandy tracts have been thickly planted with Casuarinas, which provide an abundance of firewood. Full advantage was taken of the opportunities afforded for studying the vegetation and the various cultivated crops in the country around Puri and between Puri and Madras, including rice, millet, tobacco, cotton, jute and bright-vermilion fields of chilies drying in the sun.

During the stay in Madras the Director discussed the wheat-rust problem and Dr. Mehta's proposals for suppressing wheat cultivation in the Nilghiris with Dr. Rama Reddi, the Director of Agriculture, and later with the Hon. the Minister of Agriculture and the Secretary.

The Madras Museum was visited under the guidance of Dr. Gravely. The botanical side is very well arranged, the botanical specimens being displayed in admirable cases with narrow drawers which can be pulled right out only by releasing an invisible fastening.

At the invitation of Prof. Iyengar, the Director was entertained to tea in the botanical department of Presidency College, and there met the botanical staff of the College and several botanists from other institutions in and near Madras. The fine collection of living green marine algae made by Prof. Iyengar was of very great interest.

A visit was also paid to the Madras Christian College at Tambaram, where Prof. E. Barnes, who has done so much to increase our knowledge of the local flora, is a member of the staff. This visit was paid during the Director's second stay with H.E. the Governor of Madras at Guindy. Here the gardens and those at Government House, Madras, are in the charge of Mr. George Farley, formerly a student gardener at Kew, and their beauty is largely due to the keen interest in horticulture of Lady Beatrix Stanley when the Right Hon. Sir George Stanley was Governor of Madras. A visit was also paid to the Agri-Horticultural Society's Gardens, Madras, where several interesting plants were seen. As a result of this visit plants of the trailing *Torenia travancorica* and of a fine orange-yellow form of *Crossandra undulifolia* were sent over to Kew by air mail and are now successfully in cultivation. The *Torenia* has already been figured for the Botanical Magazine.

Between the two visits to Madras the Director went to Coimbatore, Ootacamund, Mysore and Bangalore. At Coimbatore he was the guest of Mr. R. C. Broadfoot, Principal of the Agricultural College and Research Institute, and was able to make a thorough inspection of the Cotton Station with the Cotton Specialist, Sri. V. Ramanatha Ayyar, who had arranged a remarkably fine demonstration of the work in progress, methods of pollination and of

ensuring self-fertilization by smearing the unopened petals of a flower with clay to prevent the opening of the flowers. Specimens of the local races of cotton and the pests were also exhibited. Slides were also examined showing the different types of the vascular bundle arrangement at the base of young cotton flowers, which may be of considerable value in classification, since scattered or grouped bundles in different patterns appear to be constant for the species and varieties.

The millet and sorghum research work under Mr. G. N. Rangaswami Ayangar was also studied, thanks to the fine set of specimens set out for examination. These included an exhibit of *Phaseolus* varieties and all the various grain crops. At the Sugar Cane Station, Rao Bahadur T. S. Venkataraman very ably demonstrated his work on crossing *Saccharum* with *Sorghum* and with bamboo. The latter cross with a bamboo some 40 ft. high is a very remarkable one, since the hybrid is a typical cane but with a hollow stem and a good sugar-content.

The various cultivated plots of species and varieties of *Saccharum*, *Sorghum*, *Eleusine*, etc., were studied, as well as the numerous seedlings raised at the Station. The very interesting cytological work being carried out by Dr. E. K. Janaki Ammal on the sugar cane hybrids was also seen under her guidance.

The Herbarium at the College in charge of Dr. K. Cherion Jacob and the oil seed work being conducted by Dr. G. B. Patel were also examined in detail and the Director gave a lecture to the students and staff of the College. A visit was also paid to the Forestry Institute and Museum at Coimbatore.

The journey to Ootacamund was made partly by car, visits being paid to the Lower Fruit Station and to Burliar on the ascent. At Burliar, *Amherstia* was in flower and Mangosteens were in fruit, while many other interesting tropical fruits were displayed and enjoyed. The drive up was through coffee and tea gardens to Conoor with wonderful views in all directions. Sims Park and the Pomological Station—where strawberries were ripe—were also visited. Plums, pears, peaches, oranges, apples and other fruit trees were being well cultivated at the Station, which was terraced and excellently maintained.

At Sims Park the trees and shrubs were mainly exotic and included a fine collection of conifers, oaks, beeches, camellias, hydrangeas, etc. Here, as in the gardens at Ootacamund, there was a sad absence of trees and shrubs native to the country—moreover the gardens showed lack of proper attention from skilled horticulturists.

From Ootacamund the *Cinchona* plantations, and the factory at Naduvatam, were visited with Mr. Wheatley. The factory is excellent and very well arranged, but the plantations compared unfavourably with those at Mungpoo, owing partly to the lack of fully qualified men to superintend the cultivation of the plants and

to less suitable conditions. In some places the *Cinchona* appeared to be suffering from unduly heavy shade of the *Alnus* and Grevilleas, and consequent loss of water, taken from the soil by the thickly planted shade trees. It was noticed that some of the young *Cinchona* plants at the higher elevations had been cut by frost in mid-January.

On the invitation of H.H. the Maharajah, the Director proceeded to Mysore by car from Ootacamund, passing through tea and coffee estates and Teak and native forests on the beautiful drive down to Mysore State. A visit was arranged at dusk to the great Dam at Brindavan and the magnificent gardens with their fountains below the Dam were illuminated in his honour ; the display was one of remarkable beauty. Mysore City is a veritable garden city and the gardens here and at Bangalore owe very much to the skill and knowledge of Mr. Gustav H. Krumbiegel, formerly at Kew, who has devoted so many years of his life to the encouragement of horticulture in the State.

The Director then went to Bangalore *via* Seringapatam, Somnathpur and the hydro-electric works at Sivasamudram, reaching Bangalore in time for the opening of the Lal Bagh Flower Show at which he made a speech and distributed the prizes in the presence of the Dewan, Sir Mirza Ismail, Dr. Hans Luther, formerly German Ambassador at Washington, and other distinguished visitors. The Show was a remarkably fine display of flowers, vegetables and fruit, which compared very favourably with a good exhibition at the Royal Horticultural Society at home. After dining with the Dewan, the Director left for Madras and thence *via* Madura, Chanushkodi and Talaimannan to Colombo, which was reached at 7 a.m. on January 26th.

Here the Director was met by Professor Nigel Ball and visited the public gardens with the new orchid house, *Vanda spathulata* being in full flower. A long morning was then spent at University College, Colombo, and something was seen of Professor Ball's work on *Turnera*, etc. Later a visit was paid to Dr. de Sousa, Secretary of the Orchid Society of Ceylon, and his interesting collection of orchids was examined ; specimens from some of his plants he is kindly presenting to Kew.

The Director left Colombo at 5 p.m. on January 26th in the s.s. "Mooltan," and reached Kew on February 13th, having spent 20 nights in trains during the Indian tour.

Mr. E. MILNE-REDHEAD returned to Kew in the middle of March, having spent about $4\frac{1}{2}$ months collecting around Matonchi Farm in the Mwinilunga District of Northern Rhodesia (see Annual Review, 1937, 531). In addition he made a fortnight's tour into the adjacent Moxico District of Angola during January, visiting the Lusavo Falls and the Ikulu Hot Springs by the Zambezi. His collection of some 2150 numbers contains several little-known species, many of which were not previously represented in the Kew Herbarium, whilst the number of species new to Northern Rhodesia

is considerable. The collection is supplemented by material in spirit and by over 80 timber specimens.

Mr. H. S. MARSHALL, Assistant Librarian, attended the 61st Annual Conference of the Library Association held at Portsmouth and Southsea in June, as a delegate from Kew.

THE DIRECTOR and two members of the staff, Miss M. L. GREEN and Dr. C. R. METCALFE, attended the Twelfth International Horticultural Congress in Berlin from August 12th to 17th, 1938. After the Plenary Meeting, which took place at 11 a.m. on August 12th, members attended the meetings of those Sections in which their interests chiefly lay. The Director addressed the Section of Education on the international exchange of student gardeners. Miss Green contributed to the discussions on nomenclature and Dr. Metcalfe was chiefly interested in Section 8 (Plant Protection), Section 10 (Storage of Fruit and Vegetables) and in Section 17 (Special Questions in Plant Physiology). Dr. T. A. SPRAGUE also attended the Congress as a private member, and took part in the nomenclature discussions.

At the meeting of the British Association for the Advancement of Science held at Cambridge in August 1938, Dr. W. B. TURRILL gave a paper on "Ecological Isolation" in the Joint Discussion (sections D and K) on "Mechanism of Evolution." This paper has since been published in the Kew Bulletin, 1938, 384.

Mr. E. NELMES, Acting Librarian, represented the Royal Botanic Gardens, Kew, at the Fifteenth Annual Conference of the Association of Special Libraries and Information Bureau at Oxford in September.

THE ASSISTANT DIRECTOR, together with Mr. A. H. G. Alston of the British Museum (Natural History), attended, as Delegates of the British Government, the "Primeira Reunião Sul-Americana de Botanica" held at Rio de Janeiro from October 12th to 19th. The delegates were guests of the Brazilian Government during their stay at Rio and were given every facility by the Brazilian botanists to see as much as possible in the short time available. Besides attending meetings in connexion with the Congress, Mr. Gilmour paid several visits to the Instituto de Biologia Vegetal and the famous Botanic Garden attached to it, and to the botanical department of the Museum Nacional. Official excursions took place to the beautiful mountain town of Petropolis and to the interesting "restinga" formation near Cabo Frio. Every opportunity was taken for personal contact with the many Botanists assembled from all parts of South America and elsewhere, and a number of arrangements were made for exchange of material and publications. Our grateful thanks are offered to Dr. Campos Porto and his colleagues at the Instituto, and to the staff of the Museum Nacional, for all their kindness.

After the Congress Mr. Gilmour spent a week in the State of São Paulo with Prof. G. Stahel of Paramaribo and Dr. C. van de Koppel of the Koloniaal Instituut, Amsterdam. Every facility

was accorded them for seeing the botanical and agricultural work being carried out in the State and the following institutes were visited under the guidance of their respective Directors and staff : Instituto Biologico, São Paulo ; Instituto Agronomico do Estado de São Paulo, Campinas ; Escola Superior de Agricultura da Universidade de São Paulo, Piracicaba ; and the Eucalyptus Museum of the Serviço Florestal da Companhia Paulista, Rio Claro.

Mr. Gilmour returned to Rio on October 24th and the following day commenced the three-day flight to Trinidad, arriving at Port-of-Spain on the evening of October 27th. Nights were spent at Pernambuco and at Para, where the Museum Goeldi was visited.

Mr. Gilmour spent a fortnight in Trinidad, staying at the Imperial College of Tropical Agriculture as the guest of Professor Cheesman and of Mr. R. E. D. Baker. Through the kindness of the heads of the various departments of the College and of the Director of Agriculture, Mr. E. J. Wortley, and his staff, he was enabled to see much that was of botanical and agricultural interest in the Island.

On his voyage home, Mr. Gilmour called at Georgetown, British Guiana, where a brief visit was paid to the Botanic Garden with Mr. E. B. Martyn, the Superintendent, and at Paramaribo, Dutch Guiana, where Prof. Stahel showed him the work being carried out by his department. Mr. Gilmour returned to Kew on December 2nd.

PUBLICATIONS.—Ten numbers of the " Kew Bulletin " were published during the year, and the Review of the work during 1937 was issued as an Appendix. The " List of Seeds " was published as a separate pamphlet.

A new edition (the fourth) of the " Hand-List of Coniferae, Cycadaceae and Gnetaceae grown in the Royal Botanic Gardens, Kew, and at the National Pinetum, Bedgebury " was published in April. The nomenclature has been brought up to date and a section has been added on cultivation.

A fifth edition of the " Popular Guide " was published in September.

Economic Work in Tropical Agriculture

This work consists mainly in arranging for the collecting and despatch of economic plant material to scientific workers of Colonial Agricultural Departments or Research Institutions in the Tropical countries. Many of these plants are required by plant breeders or geneticists who are attempting to raise improved varieties of economic crops, others are needed to meet the demands of those who are dealing with disease-resistance problems, whilst some may be new crop introductions or plants of use as insecticides.

Bananas.—The collection and despatch of banana types to the plant breeders in Trinidad and Jamaica have proceeded. A collection of East African suckers received from Amani has, after a period of quarantine at Kew, been despatched to these two Colonies. More lately, however, particular attention has been paid to wild types, and seeds of wild bananas from Assam, North Borneo, Nigeria, New

Guinea and its neighbouring islands, and Burma have been dealt with. The usual practice is to retain a portion of the seed at Kew, where it is grown up to a certain stage, and to send the rest to the West Indies. This precaution is considered necessary in case of accident or failure to germinate after arrival in the West Indies, due to loss of viability or damage in transit.

Two suspicious cases of virus disease were noticed at Kew and the plants were destroyed and precautionary measures taken.

Cassava.—At the request of the East African Agricultural Research Station at Amani a collection of Cassava cuttings that had been sent by Dr. S. C. Harland from Brazil was received at Kew. Half the consignment was grown on at Kew and the remainder despatched to Amani where a collection is being made with the object of overcoming the mosaic disease by breeding disease-resistant types. Efforts to obtain other species of *Manihot* from Brazil, apart from *M. utilissima* and *M. dichotoma*, are now being made. Similarly cuttings of good varieties of Cassava from Malaya were sent to British Honduras at the request of that Government.

Cacao.—There is a desire on the part of the Nigerian agricultural authorities to improve the quality of Nigerian cacao by the introduction of better types from the West Indies. At the Imperial College of Tropical Agriculture in Trinidad selection work on Forestero cacao has been in progress for some years and high-yielding, good quality clones are now available. The difficulty is to effect the introduction without at the same time bringing in disease, especially the witchbroom disease (*Marasmius perniciosus*), which is causing serious damage in Trinidad. It was decided to call for the co-operation of Kew and accordingly cacao seeds from Nigeria have been planted and a number of seedlings has been raised in the Gardens. These will be used as root stocks, and bud wood from a number of rooted cuttings of selected types which have been received from Trinidad and grown under quarantine here will be worked on to these stocks. Eventually it is intended to transfer the plants so raised to the Nigeria Agricultural Department where it is hoped that they will prove a valuable nucleus in improving the quality.

Cowpeas.—Further collections of seeds have been received and despatched to Trinidad and to Delhi where the collections made by Kew are being grown and studied.

Insecticides.—Cuttings of *Derris* species received from the Malayan Agricultural Department, taken from clones selected for high rotenone content, are destined for the W. Indies and the U.S.A. A plant of *Lonchocarpus nicou* with a high rotenone content has been raised from some cuttings sent to Kew by the Bureau of Plant Industry of the U.S. Department of Agriculture, to whom special thanks are due. Seeds of *Tephrosia Vogellii* were sent to Madras, Trinidad, Amani and to the United States.

Soy bean varieties have been sent to Nigeria and South Africa.

Among other plants of economic importance that have concerned Kew are sweet potatoes, tubers of which have been transferred from India to Barbados, and *Erythrina lithosperma*, seeds of which have been sent from Ceylon to Trinidad where the plant is being tested as a possible shade tree for cacao.

The services of Kew are likely to be continued in work of this kind and may indeed be extended. Arrangements are already being made for a collection of *Passiflora* species which are wanted by Amani for breeding resistant varieties to meet the menace of virus diseases which are threatening the Passion-fruit industry in Kenya. It is possible, also, that Kew's services may be sought in connexion with *Carica* species required for breeding varieties of Papaya resistant to the yellow leaf virus disease, and in connexion with the introduction of high altitude plants from the Andes, particularly *Rubus* species, strawberries and potatoes.

The Gardens

GENERAL.—The year will be memorable for the long continued dry periods, and for the abnormally low rainfall, the total being 20 inches, as compared with the unusual amount of 29.68 inches which fell in 1937. Constant watering was necessary to prevent losses among the collections, and 36,941,000 gallons of water were used, nearly 13,000,000 gallons more than in the previous year. Additional overtime payments for watering alone entailed an expenditure of over £200. During December there were two heavy falls of snow, the one at Christmas being about 9 inches to 1 foot in depth. The snow plough was kept hard at work clearing the main walks so that visitors suffered very little inconvenience. The branches of conifers and other evergreens were cleared of snow and fortunately no damage to the trees resulted.

VISITORS.—The number of visitors to the Gardens in 1938 was 1,221,480; weekdays (other than students' days) 624,587; Sundays 523,802; students' days 73,091—an increase of 57,231 over the figure for 1937. The greatest monthly attendance was in April, with 211,452; the lowest in December with 9012. The highest daily attendance was 44,253 on Whit-Monday, and the lowest 10 on December 16th.

ARBORETUM.—Many of the trees were badly damaged by gales, particularly in the autumn, and several large limbs were broken off, as well as quantities of small branches and twigs. Two Lombardy poplars were blown down, and specimens of *Populus monilifera* and *Betula alba* were so badly damaged that they had to be removed. As a result of the breaking away of branches, decayed areas were revealed in several of the old beech trees and owing to their dangerous condition they have been felled. The fine specimen of \times *Ulmus hollandica* (\times *U. major*) growing near Museum No. III, which for some years has been under observation, proved to be diseased. In view of its position at the side of a

main path and consequent danger to the public, it had to be removed. When felled it was found to be far more decayed than had been expected. Bad atmospheric conditions continue to take toll of the conifers, and several large pine trees at the south end of the Lake, and also the specimen of *Cupressus macrocarpa*, 58 ft. high, near the Lily Pond, which is mentioned in the preface to the Conifer List, have been felled.

Dry weather and freedom from frost resulted in an exceptionally good display of flowers of *Magnolia*, *Prunus* and *Malus*. *Magnolia Sprengeri* flowered well for the first time; its deep-pink flowers were very fine and it should become a notable object in course of time.

TEMPERATE HOUSE.—Re-roofing of the various parts of this house still proceeds and the south-eastern section of the lower roof of the main building has been completed.

An outstanding operation has been the transplanting of the large Chilean wine palm, *Jubaea spectabilis*. This palm had reached to the roof of the house, and it had either to be cut down or moved to the centre of the house so that it would have sufficient space for its continued growth for some years to come; it was therefore decided to attempt the moving of the palm some 15 to 20 feet nearer the centre of the house. The work was carried out in August and the preliminary preparations, which occupied a month, entailed the removal of several yards of hot water pipes, portions of two side paths and large portions of the main paths of the Temperate House to give working space, and the excavation of the soil from the bed to a depth of eight feet over the whole area between the old and new positions for the palm. As the beds of the Temperate House are enclosed by walls four feet deep, the walls surrounding the bed in which the palm was planted had to be destroyed and also the walls of the adjoining bed to which it was to be moved, as can be seen in the photograph (Plate V, fig. 2).

It may be mentioned that owing to the palm having been planted near the end of a bed the root-spread was bounded by three of these walls, so that there was a perfect unbroken square mass of earth surrounding the roots; this remained unbroken throughout the moving operations. When the square "ball" of earth was isolated, it was first enclosed in a box of stout boards clamped together by iron bands and then eleven 10-inch square baulks of timber were placed below for the ball to rest upon. A platform of running boards of 11 by 4-inch planks, faced with sheet iron strips, was then prepared and by the aid of powerful lifting jacks a series of rollers were placed beneath the palm. With the preparation so far advanced, the actual movement of the plant, which took place in a few hours, was carried out without a hitch and the whole work reflects great credit on Mr. Raffill, Assistant Curator in charge, and the members of his staff. The magnitude of the task can be realised from the following

particulars: height of palm, 45 feet; circumference of stem at base, 11 feet 2 inches; circumference at top, 6 feet 1 inch; size of ball, 15 feet 3 inches by 12 feet 4 inches by 5 feet 6 inches; approximate weight of ball, 44 tons; approximate weight of stem of palm, 7 tons; approximate weight of timbers supporting ball of soil, 3 tons; total weight, 54 tons. Figure 1 shows the method of boxing, and figure 2 the plant ready for moving with rollers and baulks of timber in position.

After the palm had been successfully moved to its new position it was found that the old, much-pruned and rather unsightly specimen of *Araucaria Bidwillii* (Queensland) spoilt the effect of the palm and also interfered with the full spread of its leaves. Since there was another, younger specimen in the house the old one was cut down and a specimen of *Howea Belmoreana* planted in its place. The removal of the *Araucaria* has greatly increased the light and also much improved the general appearance of this side of the house.

Alterations were made to improve the collection of tree ferns at the north end of the central portion of the house; this necessitated the removal of an old *Camellia* tree and the moving of many specimens.

Among the plants which flowered remarkably well during the year may be mentioned *Luculia gratissima*, *L. Pinceana*, *Prunus campanulata*, *Kigelia Moosa* and *Acacia Hanburyana* (*A. podalyrifolia* \times *A. Baileyana*).

TROPICAL DEPARTMENT.—Palm House. The whole of the discoloured glass in the roof of the central section has been replaced and the section painted internally. Thanks to the use of the tubular type of scaffolding very little damage was done to the collections.

The shed which formerly housed the staff has been replaced by a larger permanent building provided with electric light, wash-basin, cupboards, etc.

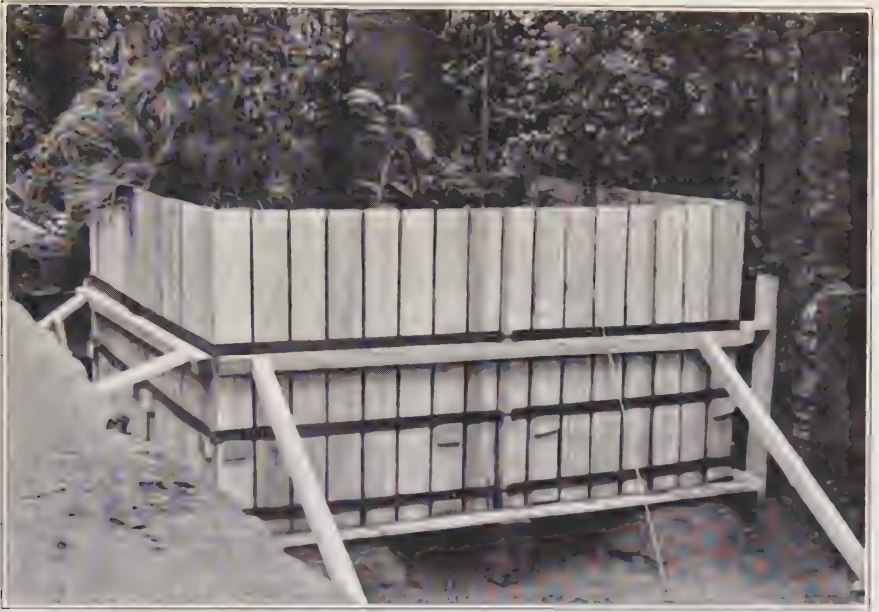
New soil was introduced into four of the permanent beds and the opportunity taken to rearrange some of the plants.

Melon Yard.—A new sectional boiler was installed in place of the old saddle boiler in the large stokehole, whilst two new electric circulating pumps were added to increase the efficiency of the hot-water circulation. A fire-proof oil store has been erected in order to keep this inflammable material apart from the general store.

Ferries.—In Pit no. 6 concrete staging similar to that being installed generally has been erected and the propagating frames have been remade. Top ventilation was reconstructed and the house painted internally and externally.

Orchids and T Range.—An important addition to the accommodation here has been the provision of a new orchid drying house for ripening off the bulbs after flowering. A new portable electric pump for use between storage tanks out of doors and in the houses proved invaluable during the dry summer. The following

PLATE V



1. Method of boxing.

Photo. S. Rawlings



Photo. S. Rawlings

2. Palm ready for moving, showing rollers and baulks of timber in position.

Moving the specimen of *Jubaea spectabilis* in the Temperate House.

[To face page 484.

houses were repainted: nos. 8, 9, 11, 12, 13A, 14A and 14B. In the case of nos. 11 and 12, which are constructed of teak, it was necessary to have the teak painted in order to arrest the superficial decay which had set in owing to the damp, tropical conditions. Owing to the long time taken over the work at an unsuitable time of year (November and December), much damage was done to the plants by the erection of tarpaulin, etc., which cut off much of the daylight. The *Cacao* tree, for instance, which was bearing an exceptionally heavy crop of young pods, has now shed nearly all of them in consequence of the protracted painting operations.

Noteworthy plants which flowered during the year are *Coleus Autrani* from Abyssinia, *Catasetum viridiflavum*, *Crassula portulacea* and *Nymphaea colorata*; thanks to the absence of fog the orchids generally were very good. Fine cones were produced by the following Cycads: *Ceratozamia mexicana*, *Encephalartos Hildebrandtii* and *E. villosus*. The dry season no doubt helped fruiting under glass, as fine crops were borne on our plants of *Carica Papaya*, *Coffea arabica*, *Citrus paradisi*, Metford Lemon, *Theobroma Cacao* and *Vitis vinifera*.

HERBACEOUS DEPARTMENT.—Considerable activity has been displayed in this department during the year and many minor alterations have been carried out. Several of the Iris beds were re-soiled and replanted, and some of the beds were removed and some new ones added to complete as far as possible the general plan of the Iris Garden.

The Alpine House (no. 24) has been entirely rebuilt and somewhat enlarged, so that there is now more room for the plants and a wider central pathway which adds considerably to the convenience of visitors.

Several alterations have been made in the Rock Garden, particularly on the west side facing the island where the limestone has been replaced by Sussex sandstone. At the southern end of the garden better accommodation has been made for growing the collections of *Primula* and *Meconopsis*.

A few of the systematic beds have been extended and those that had become overcrowded have been replanted.

Amongst the more interesting plants which flowered during 1938 were *Leucanthemum Catananche* and *Narcissus Watieri*, collected by Mr. E. K. Balls in the Atlas Mountains of Morocco; *Calceolaria Darwinii*, a native of Magellanes in the Straits of Magellan; *Phlox mesoleuca*, an uncommon plant from North America; *Tulipa violacea* and the variety *pallida*, collected and presented by Mr. A. C. Trott, late of Tehran, Persia; *Primula Cawdoriana*, raised from seed collected by Captain Sherrieff and Mr. Ludlow on their expedition in S.E. Tibet during 1936; *Rheum inopinatum*, from seed sent in by Mr. B. J. Gould, Gangtok, Sikkim; *Codonopsis Forrestii* and *Weldenia candida*.

DECORATIVE DEPARTMENT.—A considerable improvement has been effected by the removal of the two stone-edged beds and some of the superfluous pathways between House no. 4 and the Ferneries; the areas have been turfed over and a circular bed has been made in the centre of each of the new lawns to harmonise with those on the adjacent lawns.

The grass slopes of the Palm House Terrace on the west side have received attention, the angle of the bank being made less acute and then returfed. The slope now conforms to that of the main steps approaching the Palm House. Tulip disease (*Sclerotium Tuliparum*) having been prevalent in the early spring in the beds on the Palm House lawn, several of the beds have been re-soiled to a depth of 18 inches.

Some of the older varieties of hybrid tea roses, which have failed to do well during recent years, have been lifted and some of the more modern varieties introduced. Particular attention has been paid to the selection of varieties of strong constitution.

In the Conservatory (House no. 4) *Jasminum rex* flowered profusely and has been the outstanding plant of the year, flowering continuously from autumn to December.

The standard of display of popular greenhouse plants, such as winter-flowering Begonias, Gloxinias, *Streptocarpus*, Cinerarias, Calceolarias, Primulas, *Cyclamen* and Chrysanthemums has been good and has been assisted in late autumn by the absence of fogs.

As in past years the fine bulbs of *Lilium longiflorum* sent over by the Government of St. Helena made a most attractive display in the autumn.

STUDENT GARDENERS.—Seventeen students secured appointments on completion of their training. This number is three less than in 1937 but, in view of the disturbed international situation, the position may be regarded as very satisfactory.

At home, Parks Departments, in which eight men obtained posts, proved to be the most attractive. One man was engaged by the Cambridgeshire County Council as Horticultural Assistant, one secured an appointment with the Air Ministry, and one entered private service.

The six overseas appointments secured were twice the number obtained during 1937, one man proceeding to the Botanic Gardens, Singapore; two to Canada (Ontario Agricultural College, Guelph; and Dominion Arboretum, Ottawa), and two to South Africa (National Botanic Garden, Kirstenbosch; Port Elizabeth Municipality), whilst one on exchange in the United States of America who returned to Kew, was subsequently appointed Director of Horticulture at Dillard University, New Orleans.

One student on exchange in the Luxembourg Gardens, Paris, was successful in obtaining a grant from the French Government, enabling him to remain in France for further study, and one proceeded

to the West of Scotland Agricultural College, to receive additional training in Agriculture.

Of the seventeen men accepted for full course vacancies, five were recruited from Parks Departments and twelve from nurseries and private gardens.

World affairs were also no doubt largely responsible for the inability to arrange for more than five students (as against nine in 1937) to visit other countries to gain experience under the existing scheme for exchange of students. It was, however, possible to send one man to Italy (whence he had to return at the time of the crisis), and one each to the Berlin Botanic Gardens; Ecole d'Horticulture, Vilvorde, Brussels; Messrs. Duncan and Davies's Nurseries, New Plymouth, New Zealand, and the New York Botanical Garden.

Three students, one from Belgium, one from Holland and one from Switzerland were admitted to work in the Gardens on a voluntary basis for varying periods during the year.

RAINFALL RECORD.—Rainfall recorded at the Royal Botanic Gardens, Kew, during 1938 :—

	Inches.		Inches.
January	2.44	July ... ..	.89
February ... ..	.35	August	3.40
March ... ..	.26	September	2.38
April ... ..	.05	October	2.37
May	1.35	November	2.75
June ... ..	.34	December	3.42
Total 20.00 inches.			

The total for 1937 was 29.68 inches.

ORNAMENTAL WATERFOWL.—During the past year six Carolina ducks were reared, three of each sex, and four Canadian geese. Misfortune overtook the young Bar-headed and Magellan geese which were hatched. The stock was augmented by the following presentations in exchange from Dr. J. M. Derscheid, Armendy, Sterrebeek, Belgium :—

One Barrow's Golden-eye drake.
Two Common Pintail drakes.
One pair of Bahama Pintails.
Three Common Pintail ducks.
One Cinnamon Teal drake.
One pair of Versicolor Teal.
One Blue-winged Teal drake.
One Cinnamon Teal drake.
One pair of Common Teal; and
Two Bahama Pintail ducks.

A pair of Chilean Pintail was also received in exchange from Messrs. McLean and Wormald.

The Stanley Crane, which was presented to Kew in 1936 by Mr. A. Ezra of Foxwarren to take the place of the bird sent from

Pretoria in 1935, has died from tuberculosis and has not been replaced.

WILD FOWL, etc.—During the heavy snow at Christmas time two woodcock were noticed in the Gardens and numerous larks—one being seen on the snow outside the Director's Office on December 27th.

Grey squirrels continue to come into the Gardens, probably from Richmond Park, and during the year 307 have been shot. Rabbits unfortunately have tended to establish themselves and 43 have been killed during the year. They apparently have come from the Old Deer Park, where they are reported to be numerous.

Rats also find the holes under old stumps good breeding places, and are attracted, no doubt, by the food given to the birds, and some 250 have been destroyed in the course of the year.

MATERIAL CONTRIBUTED TO AND DISTRIBUTED FROM THE GARDENS, 1938

During the year, 966 separate consignments of plants, bulbs, seeds, etc., were received and 683 consignments despatched. The annual distribution of seeds amounted to 198 separate consignments comprising 6691 packets of seeds of herbaceous plants and 4207 of trees and shrubs. The aggregate shows an increase of 1073 packets as compared with 1937. Eight Wardian cases containing economic, ornamental and other plants were despatched during the year.

ECONOMIC PLANTS.—The following is a list of material of the more important economic plants received and distributed during the year :—

Agropyron spp.—Seeds received from the Institute of Agronomy, Belorussia, U.S.S.R., sent to the Plant Research Bureau, Wellington, New Zealand.

Citrus spp. and varieties.—Seeds from La Mortola, Italy, sent to Mr. H. Guthrie Smith, New Zealand.

Derris spp. for use as insecticides.—Cuttings from the Department of Agriculture, Federated Malay States, sent to Bureau of Plant Industry, Department of Agriculture, Washington, U.S.A.

Ephedra sinica.—Seeds from Prof. B. E. Read, Henry Lester Institute of Medical Research, Shanghai, China, were sent to the Division of Plant Industry, Australia; the Agricultural Research Service, Anglo-Egyptian Sudan; Department of Agriculture, Cyprus; Mr. C. C. Henriques; Imperial Institute, South Kensington; Forest Research Institute, Dehra Dun, India; Department of Agriculture, Kenya; Department of Agriculture, Malta; Department of Agriculture, Mauritius; Department of Scientific and Industrial Research, New Zealand; Department of Agriculture, Palestine; Agricultural and Forestry Officer, St. Helena; Division of Plant Industry, Pretoria, South Africa; Department of

Agriculture, Southern Rhodesia ; Mr. Gilbert Walker, Kenya ; and to Mr. I. B. White, New South Wales.

Erythrina lithosperma.—Seeds from the Department of Agriculture, Ceylon, sent to the Imperial College of Tropical Agriculture, Trinidad.

Gossypium sp. Bourbon var.—Seeds from the Department of Agriculture, Madras, sent to M. Guy Roberty, French West Africa.

Ilex paraguayensis.—Seeds from Liebig's Plantations, Argentine, sent to Mr. A. B. Wegodapola, Ceylon.

Ipomoea purga.—Cuttings from Department of Agriculture, Federated Malay States, and Mr. S. C. Harland, Instituto Agronomico, Campinas, Brazil, sent to Agricultural Department, British Honduras, and East African Agricultural Research Station, Amani.

Musa sp. var. agaba.—Seeds collected by the late B. D. Burt in Northern Nigeria, sent to Trinidad.

Musa errans.—Seeds from Division of Plant Industry, Manila, sent to Department of Science and Agriculture, Jamaica, and Trinidad.

Musa sp. var. Ngapyaw-nwe.—Seeds from Division of Plant Industry, Manila, sent to Department of Science and Agriculture, Jamaica, and Trinidad.

Musa spp.—Seeds from Botanic Garden, Buitenzorg, sent to Trinidad.

Musa spp.—Seeds from Silviculturist, Maymo, Burma, sent to Trinidad.

Musa sp. var. Pisang Awak Legor.—Seeds from Department of Agriculture, Federated Malay States, sent to Trinidad.

Musa spp.—Seeds from Department of Agriculture, New Guinea, sent to Trinidad.

Musa sp.—Seeds from Botanic Garden, Singapore, sent to Trinidad.

Musa Homblei.—Seeds from Capt. K. R. Paterson, Northern Rhodesia, distributed to East African Agricultural Research Station, Amani ; Agricultural College, Coimbatore ; Department of Science and Agriculture, Jamaica ; Trinidad.

Pineapple.—Suckers of the Montserrat var. from Department of Agriculture, British Guiana, and suckers of the Black Antigua and Sugar Loaf vars. from the Royal Botanic Gardens, Trinidad, were sent to Captain K. R. Paterson, Northern Rhodesia.

Salix spp.—Cuttings from Mr. J. M. Lee, Madeira, sent to Department of Agriculture, Mauritius, and Long Ashton Experiment Station. Cuttings from Long Ashton Experiment Station were also sent to Department of Agriculture, Mauritius.

Soya Beans, Kabott and Mandarin vars.—Seeds from Dominion Experimental Farm, Ottawa, Canada, distributed to Fordson Estates ; Department of Agriculture, Nigeria ; J. L. North, 60, Grove Park Terrace, London, W.4 ; Prof. J. Reilly, University College, Cork, Eire ; Rothamsted Experiment Station ; Plant Breeding Station, Barberton, South Africa.

Tephrosia Vogelii.—Seeds from Department of Agriculture, Nyasaland, distributed to East African Agricultural Research Station, Amani ; Department of Agriculture, Madras ; Department of Agriculture, Trinidad ; Bureau of Plant Industry, Washington, U.S.A.

In addition, the following material of economic plants has been either received or distributed :—

Material received :—

Bambusa spp.—Plants, Bureau of Plant Industry, Washington, U.S.A.

Cocos nucifera.—Nuts, West Indian Committee.

Coriandrum sativum.—Seeds of 1936 and 1937 crops, Messrs. Stafford Allen and Sons.

Grape Fruit \times Tangerine.—Seeds, Mr. J. Dinswood, 94, Waverley Road, Ewell, Surrey.

Musa sp.—Suckers, East African Agricultural Research Station, Amani.

Musa sp.—Suckers, Imperial College of Tropical Agriculture, Trinidad.

Musa sp.—Seeds, Mr. P. H. Carpenter, Indian Tea Association.

Oryza spp.—Seeds, Jardin botanique, Brussels.

Phyllostachys spp.—Rhizomes, Bureau of Plant Industry, Washington, U.S.A.

Thea sp.—Seeds, Mr. H. C. Laws.

Theobroma Cacao.—Seeds, Cadbury Bros., and Department of Agriculture, Nigeria.

Theobroma Cacao.—Rooted cuttings of selected forms, Imperial College of Tropical Agriculture, Trinidad.

Material distributed :—

Arundinaria spp.—Plants, Mr. Howard Fyfe, U.S.A.

Bambusa spp.—Plants, Mr. R. J. Gardner, Natal.

Bromelia Magdalenae.—Plants and suckers, Department of Agriculture, Kenya.

Ceiba pentandra.—Seeds, Agricultural experiment Station, Buitenzorg, Java ; Forests Department, Gold Coast.

Colocasia spp.—Tubers, Department of Agriculture, Barbados ; Department of Agriculture, Gold Coast.

Cowpeas.—Seed, Imperial College of Tropical Agriculture, Trinidad.

Derris elliptica.—Cuttings, Government Botanic Garden, Crimea, U.S.S.R.

Ephedra spp.—Cuttings, Department of Agriculture, Kenya.

Manihot utilissima.—Cuttings, East African Agricultural Experiment Station, Amani.

Mentha sp.—Plants, Agricultural Experiment Station, Buitenzorg, Java.

Mimosa bracingana.—Seed, East African Agricultural Research Station, Amani.

Mundulea sericea.—Seed, East African Agricultural Research Station, Amani.

Musa spp.—Suckers, Imperial College of Tropical Agriculture, Trinidad.

Passiflora edulis.—Seed, East African Agricultural Research Station, Amani.

Phyllostachys bambusoides.—Plants, Mr. Howard Fyfe, U.S.A.

Rhamnus Purshiana.—Cuttings, Imperial Chemical Industries, Ltd., London.

Xanthosoma sp.—Tubers, Department of Agriculture, Barbados ; Department of Agriculture, Gold Coast.

ORNAMENTAL AND OTHER PLANTS.—The following is a list of material of the more important ornamental and other plants received during the year :—

Public Institutions :—

Albany Museum, Grahamstown.—Seeds of *Pelargonium reniforme*.

Bolus Herbarium.—Plants collected by Mr. E. Esterhuysen, including *Anacampseros* spp., *Conophytum* sp., *Stomatium* sp., *Cheiridopsis* spp., *Nananthus* sp., *Vanheeridia* sp.

Cambridge Botanic Garden.—A collection of plants of *Iris* and *Alstroemeria* spp.

Dartington Hall.—Plants of *Primula* spp., *Meconopsis* spp., and *Mimulus* sp.

Edinburgh, Royal Botanic Garden.—A large collection of seeds from Western China (Yu collection), and seeds collected by Ludlow and Sherriff in Bhutan and Tibet.

John Innes Horticultural Institution.—A collection of Calceolarias and tubers of tree *Dahlia*.

Lloyd Botanic Garden, Darjeeling.—Seed of *Chirita* spp., and *Didymocarpus* spp.

Madras Agri-Horticultural Society.—Seeds and plants, including *Torenia travancorica* and *Crossandra undulifolia*.

Pretoria, Division of Plant Industry.—Seed of *Pelargonium* spp.

St. Helena, Agriculture and Forestry Department.—A consignment of bulbs of *Lilium longiflorum*.

Trinidad, Royal Botanic Gardens.—Plants of *Amherstia nobilis*, *Camoensia maxima*, *Bougainvillea* "Mrs. McLean," *Hibiscus* "Miss Betty," *Napoleona imperialis* and a collection of seeds.

Private Donors :—

Messrs. Armstrong & Brown.—Fine specimen plants of *Vanda Batemannii* and *Coelogyne pandurata*.

Lt.-Colonel F. M. Bailey.—A collection of plants from Nepal.

Major H. Beddington.—A collection of orchids from British Guiana and Brazil.

Mr. C. M. Dammers.—Seeds of *Dendromecon rigidum*.

Mr. S. G. A. Doorenbos.—A collection of trees and shrubs.

Mr. J. W. Drabble.—A number of fine specimen plants of rare orchids.

- Dr. P. Gosse.—Seeds of *Trochetia erythroxylon* from St. Helena.
 Mr. B. J. Gould.—Seeds from Tibet.
 Mrs. F. J. Hanbury.—A collection of British plants.
 Mr. H. Q. Levy.—A collection of Jamaican orchids.
 Mr. P. Lloyd.—Seeds from Mount Everest expedition.
 Mr. F. R. Long.—A collection of Haworthias and seeds of *Pelargonium* spp. from South Africa.
 Mr. C. M. Maggs.—Seeds collected during the "Cap Pilar" expedition.
 Dr. F. A. Rodway.—A collection of Australian plants.
 Mr. L. de Rothschild.—A collection of Rhododendrons.
 Dr. Soysa, Ceylon.—Cuttings of *Vanda spathulata*.
 Dr. R. Seligman.—Plants collected during the Jan Meyen expedition.
 Miss D. Shand.—Tubers of *Chloraea* sp., and bulbs of *Zephyranthes* sp. from Chile.
 Rev. C. Smith.—A collection of orchids.
 Prof. N. J. G. Smith.—Plant of *Euphorbia* sp., infected by *Viscum minimum*, from Grahamstown, S. Africa.
 Mrs. M. Thompson.—A collection of ferns comprising 330 species.
 Capt. F. Kingdon Ward.—Seeds from 1937/38 expedition.
 Lord Wigram.—Seeds from Nepal.

The following is a list of material of the more important ornamental and other plants distributed during the year :—

Public Institutions :—

- Amani, East African Agricultural Research Station.—Tubers of *Calanthe* sp.
 Bedgebury Pinetum.—460 trees and shrubs, and seeds of *Viscum album* growing on spruce from Mr. A. Beer, Innsbruck, for sowing on spruce.
 Blaksley Botanic Garden, California.—Plants of *Ceanothus* spp.
 British Guiana, Department of Agriculture.—Seeds of *Hyphaene thebaica* received from Kenya Forest Department.
 Madras Agri-Horticultural Society.—Plants, *Punica Granatum*.
 Ministry of Labour Social Service Centre, Durham.—A collection of trees and shrubs.
 Southampton, Redbridge Government Training Centre.—A collection of trees and shrubs.

Private Recipients :—

- Dr. J. M. Derscheid.—A collection of bamboos and Rhododendrons.
 Mr. H. Q. Levy.—A collection of orchids.
 Dr. E. Rama.—A collection of orchids.
 Special distributions of seed of *Juglans nigra* and *Fritillaria Roylei* were made.

Wardian cases of plants were sent to Department of Agriculture, Bermuda; Department of Agriculture, Ceylon; Government House, Gibraltar; Government Gardens, Khartoum; Agri-Horticultural Society, Madras; Botanic Gardens, Singapore;

Bedgebury Pinetum

About $3\frac{1}{4}$ acres of the new ground taken over and fenced during the winter of 1937-38 were planted in February with a miscellaneous collection of deciduous trees and shrubs and a few groups of conifers, the object being to provide shelter for the Pinetum and to produce a display of autumn colour. Two avenues were formed through the area, one being outlined with *Liquidambar styraciflua* and the other with *Nothofagus obliqua* and *N. procera*. Most of the plants used were sent from Kew. The remainder of the ground transferred by the Commissioners of Crown Lands in 1937 is being cleared of chestnut coppice and it is hoped to begin planting it next autumn.

Warm weather in March excited many trees into premature growth and the young shoots were badly crippled by very cold winds and severe frosts during April and May. However, the growing season was a good one for trees that began to grow in late spring, and even some of the frosted ones made a good recovery. Although there was a considerable shortage of rain during the early part of the year, the only trees to suffer from drought were some of those planted in late February. There were several violent wind storms during summer and autumn but they caused little trouble, and various trees that required stakes a few years ago were not disturbed.

By arrangement with the Forestry Commission, about 100 trees and shrubs were moved from Gravetye Manor to Bedgebury in November. Owing to close original planting at Gravetye, many trees were preventing one another from growing as they should ; some thinning out was therefore necessary, and, to prevent waste, the opportunity was taken of transferring a selection to the Pinetum.

About 300 of the naturally regenerated Scots pines that had been allowed to grow amongst the collection trees for furnishing and shelter have been removed during the last few months to give room to permanent trees. These pines had grown remarkably fast, and although only 11 and 12 years old, many of them exceeded 20 feet in height with trunks 6 inches in diameter at the base.

As usual, a few insect pests have given trouble, but the most serious losses have again been caused by late spring frosts, cold winds, and honey fungus. In some instances trees that were frost-tender in spring a few years ago are withstanding the cold better. With regard to the fungus it can only be hoped that it will gradually disappear from the ground as the old tree butts are grubbed up or decay.

The rainfall for the year amounted to 30.75 inches. The heaviest fall on a single day was 1.04 inch on October 3rd. In March the maximum temperature in the screen rose to 60 or more degrees Fah. on 19 days, the warmest day being March 30th with 66°. November was also abnormally warm and on several days the temperature

rose to 60° or more. On November 5th 67° were recorded. As in other years, ground temperature readings taken in five places over 50 acres of ground varied a good deal between low places and higher ground a few hundred yards away. Thus, on May 9th the temperature fell to 16° in low places, was 5° higher on higher ground, and 27° in the screen, and on March 18th there was a difference of 7° between low and high ground. However, during the heavy snow at the end of December, the thermometers in low places sometimes registered a little higher temperature than those in higher positions. The coldest morning was April 18th, when the temperature fell to 14°.

The Museums

The number of enquiries by correspondence and personal visits was well up to the average. Interest in *Ephedra* for medicinal purposes, referred to in last year's report, has continued. During the year small consignments of seed of *Ephedra sinica* Stapf were fortunately obtained from a correspondent in China from wild plants. This seed has been sent to East Africa and various other Empire countries for trial. As this is the most important medicinal species of *Ephedra* in China, it is hoped cultivation will be successful in at least some of the areas to which seed has been despatched.

As a result of the increasing use of a new type of detergent (sodium lauryl sulphate), which is superior to ordinary soap in many respects and is the basis of the present day soaps that may be used with sea-water or very hard water, enquiries have been received from trade sources for likely supplies of lauric acid. A superficial survey of the family *Lauraceae*, from the point of view of oil-yielding species, was carried out and suggestions made to those interested.

The extended use of "vegetable ivory nuts" (seeds of *Phytelephas macrocarpa* Ruiz et Pav. and *Hyphaene thebaica* Mart.) for ornamental articles of all kinds has led to several specimens of these seeds, either in the original or made up forms, being submitted for identification with requests for information.

In the early part of the year a large and interesting collection of native drugs and medicinal plant-products from various parts of northern Africa was received from the Department of Geography and Anthropology of the University of Aberystwyth. The naming of this collection was no light task, especially as there was much fragmentary material which required a good deal of time. An interesting point in connexion with these native medicines was the very large number of ingredients that may be used for a single mixture. As many as twenty different plant-products were encountered in one sample.

In connexion with illicit drug traffic and the use of "Indian hemp" (*Cannabis sativa* L.) for this purpose, a collection of "hemp" samples from various parts of the world has been supplied to the police authorities for use in their own laboratory investigations.

Apparently this drug not infrequently makes its appearance in cigarettes under the Mexican or Central American names of "marijunga" or "marihuana."

The mysterious American insecticidal plant "yerba de la pulga," for which such extravagant claims were made in some quarters, is now believed to be *Helenium quadridentatum* Labill., for plants raised from "yerba de la pulga" seed in the United States turned out to be this species. Accounts of the supposed valuable properties of "yerba de la pulga" appeared in various popular journals and numerous enquiries about it have been received at Kew. It would appear now that most of these claims are quite ill-founded, for *H. quadridentatum* is a comparatively well known species and has no outstanding insecticidal properties.

The reeds of *Arundo Donax* L. have been imported for many years for the manufacture of musical instruments. Four years ago root-stocks of this species were sent by request to a correspondent in Kenya. They were planted near a stream and grew well, appearing to be perfectly at home and reaching a height of about 15 feet. They remained entirely free of disease although it was found some of the canes were prone to outgrow their strength and fall over. Selected canes, when tested by instrument makers in London, were found to be well suited for certain instruments, notably the double reed of the oboe. Such instruments made with them were found to have good resistance without being metallic in tone. Considering the price of French and Spanish canes, however, and the distance of Kenya, it is doubtful whether cultivation in that country is likely to have commercial possibilities.

The work of checking and adding to the Arboretum Herbarium, and to the Herbarium of Economic Plants, has been continued.

The extraction of the smaller bottles of seeds and fruits, and small timber specimens from the show cases in No. 1 Museum has been completed. The former are classified on the book-shelves of the office in Museum No. 1, and the latter are now systematically arranged on shelves in the hall of Museum No. 4.

The provision of additional shelves has allowed a re-arrangement of the books in the library.

At the Royal Society's *Conversazione* in May an exhibit of portraits of some botanists after whom genera have been named was shown, together with a small exhibit tracing the evolution of the South African "grapple fruit," *Harpagophytum procumbens* Burch. These have since been displayed in Museum No. 3. Visitors to this Museum have shown great interest in the special exhibit of walking sticks mentioned in last year's report.

An exhibit showing the relationship between the elm bark-beetles (*Scolytus* spp.) and the Dutch elm disease caused by the fungus *Ceratostomella Ulmi* Buisman has been arranged in Museum No. 4. The beetles have a wide distribution in the British Isles and are the principal cause of the spread of this destructive disease.

The relabelling of the Gymnosperms in Museum No. 3 has been completed, and further progress has been made in Museum No. 1.

A good deal of time has been given by one member of the staff to the preparation of an English edition of the recently published work on the Opium poppy by Dr. Tj. J. Addens entitled—"De Verspreiding van de Opiumcultuur en de Handel in Opium" (Joh. Enschedé en Zonen, Harleem, 1938). Dr. Addens commenced this work two or three years ago when he spent several weeks working on opium in the Museums.

Members of the Museum staff have continued to serve on the Consultative Committees of the Imperial Institute and the Crude Drugs Sub-Committee of the British Pharmacopoeia Commission for which draft monographs of the microscopy of a number of vegetable drugs have been prepared.

PRESENTATIONS TO MUSEUMS :—

Mr. T. Hedley Barry, London : specimens of natural resins.

Mr. V. A. Beckley, Nairobi, Kenya : fibre from butts of sisal leaves, *Agave sisalana* Per., considered for upholstery and brushmaking.

The Government Botanist, Brisbane, Queensland, Australia : several varieties of the Macadamia nut as grown in Queensland.

Agricultural Department, British Honduras : seed of *Ceiba pentandra* Gaertn.

The British Legion Poppy Factory, Ltd., Richmond, Surrey : dyed leaves of *Phoenix dactylifera* L., used for decorative purposes.

Mr. L. Chalk, Imperial Forestry Institute, Oxford (through Dr. H. L. Shatz of the U.S. Department of Agriculture Forestry Service) : various wood specimens.

Mr. W. S. Dahl, London : samples of soy bean powder and soy bean protein, *Glycine Max* (L.) Merr.

Mr. C. A. Gardner, Royal Botanic Gardens, Kew : inkstand of Australian crown mulga wood.

Mr. J. S. L. Gilmour, Royal Botanic Gardens, Kew : sample of "resina de jatoba" (resin of *Hymenaea Courbaril* L.?) from N. Bahia, Brazil.

Conservator of Forests, Nairobi, Kenya : five sections of *Senecio* stems collected by E. J. Honoré, Esq., on Mount Elgon.

The Director, Royal Botanic Gardens, Kew : booklet of sample sheets of vegetable pulps from India.

Dr. H. King, National Institute of Medical Research, Hampstead : five wood specimens of *Strychnos* spp. with corresponding herbarium material.

Comm. A. Lucas, Department of Antiquities, Cairo, Egypt : samples of timber found while repairing the Nilometer Well, Roda (erected A.D. 716).

Messrs. Maxwell Plaistow and Co., Ltd., London : samples of Plaimar sandalwood oil.

Dr. R. Melville, Royal Botanic Gardens, Kew : elm twigs showing feeding damage of the elm bark-beetle.

Mr. E. W. B. H. Milne-Redhead, Royal Botanic Gardens, Kew : timber specimens from north-western Rhodesia.

Nipah Distilleries of Malaya, Ltd., Kuala-Selangor, Malaya : sample of nipah sugar (*Nipa fruticans*).

Mr. J. Parkin, Blaithwaite, Wigton, Cumberland : log of *Eucommia ulmoides*.

Mr. G. A. Peacock, Deansgate, Manchester : five wood samples.

Mrs. M. G. Phillips, Kew, Surrey : walking-stick made from a Jersey-cabbage stem.

Major General S. H. Powell, Walmer, Kent : photographs of Indian trees.

Prof. S. J. Record, Yale University School of Forestry, U.S.A. : four specimens of timbers.

Prof. A. Rehder, Arnold Arboretum, Massachusetts, U.S.A. : 526 specimens of woody plants for the Arboretum Herbarium in exchange.

Mr. Athelstan Riley, Jersey, C.I. : photograph of citron growing in the open-air in Jersey.

Mr. H. Ritchings, Wimbledon : models of Chinese agricultural implements.

Mr. E. Rutenberg, London : Russian cigarettes.

Dr. J. M. Walter (U.S. Department of Agriculture), University Museum, Oxford : elm Bark-Beetles and examples of their breeding galleries in elm wood.

The Marianne North Gallery

The improvements in the Gallery which were carried out in 1936 (see Annual Report for 1936, 554), have now been completed by the provision of a Ruboleum covering for the floor, both in the main gallery and in the studio devoted to the collection of water-colour drawings. When Miss North built the Gallery the floor was tiled with small, square, red, black and buff tiles. As these were unduly conspicuous and detracted attention considerably from the pictures, H.M. Office of Works agreed to have the tiled floor covered with a soft brown Ruboleum and the new flooring greatly enhances the effect of the pictures and gives spaciousness to the Gallery.

The curved-out supports of the protective railing which projected into the Gallery and curtailed the floor space have been cut down to a height of about 2 feet and are much less obtrusive than before. This alteration also gives more space in the Gallery for visitors and has much improved the general effect.

Four new wooden seats have also been provided in place of the somewhat unsightly iron-framed seats which were formerly in the Gallery, and the pictures which were between the seats have been re-hung on stands which are placed between the two pairs of wooden seats.

Jodrell Laboratory

As usual, many specimens of timbers, fibres, roots and other miscellaneous material have been examined microscopically in order to determine their botanical identity. Although the number of specimens examined has been about the same as in recent years there have been fewer unusual items. The type of material has, however, ranged from dart boards made of *Juncus* sp., to a collection of bazaar medicines from Morocco, and pieces of wood from the Nilometer well.

Following a meeting held at Kew in November 1937 to discuss the use of hormone-like chemicals to stimulate the formation of roots on cuttings, a "Plant Hormone Committee," of which the Assistant Keeper is convener and secretary, has been formed to consider the applications of phytohormones in horticultural and agricultural practice. The Committee has so far held four meetings at the Laboratory, at one of which Dr. P. W. Zimmerman of the Boyce Thompson Institute for Plant Research, Yonkers, U.S.A., was present by invitation. A list of species which practical nurserymen find to be moderately or very difficult to propagate by means of cuttings has been prepared and published (*Gard. Chron.* **103**, 433; 1938), in the hope that anyone interested may be induced to experiment with these difficult plants and report results to the committee. The committee has received reports of experiments in progress on rooting cuttings of a wide range of species at various research centres in Great Britain, New Zealand, the Straits Settlements and elsewhere. A scheme is under consideration for compiling a propagation index to include particulars of the localities, time of year, and other conditions under which each species or variety has been successfully propagated.

A considerable number of experiments on rooting cuttings with the aid of "hormones" have also been made at Kew in collaboration with Mr. W. G. Templeman of the Imperial Chemical Industries Research Station, Jealott's Hill, and members of the gardens staff. It is hoped that an account of the more important results that have been obtained so far will shortly be prepared for publication in the *Kew Bulletin*.

Work on the preparation of a new book on the vegetative anatomy of the Dicotyledons has been started in collaboration with Dr. L. Chalk and Dr. M. M. Chattaway of the Imperial Forestry Institute, Oxford. The book, the original suggestion for which was put forward by the Research Committee of the Association for the Study of Systematics in Relation to General Biology, and which is to be published by the Clarendon Press, Oxford, will contain an account of the anatomy of the vegetative organs of the Dicotyledons by families, based on published literature supplemented by original observations. It is estimated that it will take about five years to complete this work.

In connexion with the compilation of this work it has been found necessary to extend the scope of the collection of microscopical slides which has hitherto been devoted mainly to sections of wood. Slides of representative herbaceous stems and leaves from the various families are therefore now being prepared, nearly 700 having been completed.

An article on the axillary tubercles and root tubers of *Ranunculus Ficaria*, based on work which has been recorded in recent annual reports, was published in the Annals of Botany (Ann. Bot. n.s. **2**, 145, 1938), and a further article on the sexual reproduction of this species will appear shortly in the same journal.

The following visitors have worked at the laboratory during the year: Mr. L. A. Boodle (identification of material excavated from Egyptian tombs); Mr. J. E. Senaratna (anatomy of *Leptaspis*); Mr. J. Pryde (identification of chemical substances present in certain S. African woods); Mr. Enver Duzel (elementary microtechnique); Mr. Doxey (fixing cytological material); Mr. Collett (anatomy of *Senecio*); Miss W. M. Curtis (anatomy and influence of phytohormones on *Taraxacum*); Miss E. L. Perry (anatomy of *Acanthaceae*); Miss K. Sealy (mycology and seed cleaning); Miss E. Wilton (anatomy of grasses).

DRAWING AND PHOTOGRAPHY.—A rather larger number than usual of borrowed specimens has been photographed for our own collection and photographs of many Kew type specimens have been made for other institutions.

Living plants have been drawn or photographed for our records, including some interesting illustrations of the twisting of orchid flowers and photographs of mosaic diseases in certain species of bananas.

Photographs and drawings have been prepared for various Colonial publications and work done for Hooker's "Icones Plantarum." Plates were drawn for Dr. Turrill's description of a new Crucifer.

Considerable time was spent in preparing for the press the illustrations of Atchley's "Flora of Attica," and in correcting the colour proofs.

An improved system of lighting for the photography of dried specimen sheets has been devised and is at present being constructed by H.M. Office of Works.

The Herbarium

EUROPE, NORTH AFRICA, AND ORIENT.

About 11,000 numbers were received for incorporation in this department of the Herbarium. This figure includes 6312 numbers received for identification or verification. About 11,400 sheets were mounted, and approximately the same number was laid in.

Additions to the collections from the British Isles have been made by members of the Kew staff, especially from Gloucestershire,

Suffolk, Wiltshire, the Channel Islands, Wales, and Ireland. Miscellaneous British collections were received from Mr. J. P. M. Brenan, Mr. I. H. Burkill, Mr. F. M. Day, Mr. J. D. Grose, Mr. P. M. Hall, Prof. J. W. Heslop Harrison, the executors of the late Mr. — Harvey (Shuttleworth Herbarium)*, Col. H. H. Johnston, Mr. J. E. Lousley, Mr. F. K. Makins, Rev. H. J. Riddelsdell, Captain R. S. Vine, and Mr. C. H. Wright. In addition, Miss C. Welfitt-Nicholls presented a collection of 1869 sheets of well-prepared specimens of British plants. These were selected with great care in order to show different stages in the life-history, and will prove particularly useful.

The following important collections of plants (totalling over 1320 numbers) from the Balkan Peninsula have been presented during 1938:—Crete, Greece, and Cyclades (Mr. P. Davis and Mr. M. Ogilvie Grant); Albania (Mr. Ian Hepburn); Pyrgos district, Athos Peninsula (Mrs. F. S. Loch); Thrace (Mr. H. G. Tedd); Dalmatia (Mr. G. E. Martindale); and various countries of the Balkan Peninsula (Museum and Botanic Garden, Geneva). The collections of Mr. Davis were particularly interesting since they contained a number of species not previously represented at Kew, and also several new to science. Mr. Martindale's material from Dalmatia was noteworthy for the beautiful preservation of the abundant material and for the fact that it was made in the winter and early spring, thus supplementing other recent collections made at later seasons. Mrs. Loch's collection (45 sheets) was made to illustrate the plants, native to the Pyrgos district, used in dyeing wool for rug making. The collection includes plant-material and samples of the dyed wool. As Mr. H. G. Tedd has now left Thrace, the 1938 material may be his final addition to the valuable collections he has sent to Kew over a period of nine years from Thrace and neighbouring districts. A full account of the Thracian material is being prepared for publication. Mr. I. Hepburn's collection from Albania contained some very useful additions to the Kew Herbarium and also a number of new records. The collection of 499 numbers from the Museum and Botanic Garden, Geneva, was very valuable, as it consisted largely of duplicates of well-known collections either not represented or incompletely represented at Kew. In addition to the above presentations, material from the Dobruja was purchased from Progressul Stiintific, Bucharest, and Albanian and Macedonian specimens from Dr. F. Lemperg.

Specimens from Estonia were presented by the Tartu University; from Roumania by the University of Cluj; from Italy and Switzerland by Mrs. Eastes; from northern Yugoslavia by Mr. G. E. Martindale; and from various European countries by Mr. H. S. Redgrove. Useful sets of plants collected in Czechoslovakia and in Denmark were presented by members of the staff.

Mr. W. T. Stearn presented a small collection made in Corsica by Mrs. F. Noel, and Miss J. Russell a collection from Portugal.

* Thanks are due to the donors of this collection, who gave no address.

A miscellaneous collection of 90 specimens from various European countries was received from the Naturhistorisches Museum, Vienna.

Special attention is now being paid to the flora of Cyprus, and several valuable additions have been received during the year under review. Mrs. C. M. Kennedy has presented a rich and excellently prepared collection of 1320 numbers, made by her largely in the mountains of the centre and north of the island. Features of the collection are the abundance of well dried specimens, the full field notes, and the frequent representation of different phases of the life-histories of the species. As Mrs. Kennedy is for the present resident in Cyprus it is hoped that she will continue her activities on our behalf. Already she has not only greatly increased the value of the Kew collections, but has discovered several species new to science and a considerable number of species not previously known from Cyprus. Mr. A. Syngrossides, of the Department of Agriculture, Nicosia, has continued to send contributions through his Department. As his collections have mainly been in districts other than those being investigated by Mrs. Kennedy they largely supplement her activities. Smaller collections from Cyprus have been received from Mrs. Chapman (through the Department of Agriculture, Cyprus), Lady Loch, and Mr. C. H. Wyatt.

Other Oriental collections presented during 1938 include the following: Asia Minor (presented by the Arnold Arboretum, collected by Gorz); Transcaucasia (Baku Academy of Sciences); Palestine (Mr. A. C. Trott); Sinai (Ministry of Agriculture, Egypt); Iran (Rev. R. Iliff); and Arabia (Miss Freya Stark and Miss E. W. Gardner, of the Wakefield Expedition, and Mrs. V. Dickson). In addition a collection of Palestinian plants was purchased from Messrs. Vester & Co.

From Morocco useful additions were presented by Mr. A. W. Trethewy and Mr. A. A. Cruickshank. Prof. P. E. Newberry presented a fine set of specimens of wild and cultivated olives collected by him in Morocco. These were accompanied by an excellent series of photographs, which illustrate the habit and habitats of the trees, and by valuable field notes. Combined with Prof. Newberry's previous gifts there is now at Kew an important series of specimens illustrating the distribution and polymorphism of the olive, wild, feral, and cultivated. A set of 72 specimens of rare and endemic Moroccan plants was purchased from M. Jean Gattefossé. Specimens from Tunisia and Algeria were presented by Mr. N. D. Simpson.

The Leningrad Academy of Sciences presented various sets of specimens collected in the U.S.S.R. In the Kew arrangement of the Herbarium these come partly from Europe, partly from the Orient, and partly from North Asia. Mention should especially be made of 36 sheets of European species of *Tamarix*, which will prove very useful in further research on the taxonomy of this difficult genus.

Major F. C. Stern presented 41 specimens of *Paeonia* from various countries prepared from plants in cultivation at Highdown. Mr. W. T. Stearn presented a set of cultivated plants of *Epimedium*. In continuation of the collection of important agricultural plants made by the Hamburgisches Staatsinstitut für angewandte Botanik, 89 herbarium specimens and 93 bottles of seeds were purchased. The collection at Kew has thus been made complete up to date.

All available, named, and written up duplicates have been distributed to various botanical institutions, mainly in exchange for some of the collections referred to above.

Miss June Burroughes and Mr. M. Ogilvie-Grant have kindly given assistance during the past year in the naming of collections and in re-classifying material in the Herbarium.

Mr. A. Chevalier, of Liège, was given a five months' course of training in herbarium methods. He has now returned to Belgium, and one of his duties will be to take charge of a herbarium connected with the Botanic Garden at Liège.

Publications.—On the occurrence of *Fagus orientalis* in Greece (K.B. 1938, 38).

A new species of *Delphinium* from Afghanistan (K.B. 1938, 86).

On the flora of the Nearer East; XIX (K.B. 1938, 460).

Biarum Davisii Turrill, sp. nov. (Gard. Chron. **104** (3rd series), 437: 1938).

Statistical studies on two populations of *Fraxinus* (New Phyt. **37**, 160: 1938).

ASIA.

INDO-MALAYA.—About 5700 sheets were laid in during the year. This hardly keeps pace with the incoming specimens, and no impression on arrears has been made. It is estimated that about 10,000 specimens in the Stores from India, Burma, Ceylon and Siam await mounting.

About 1300 specimens from Bhutan were received from Mr. B. J. Gould, I.C.S., Resident in Sikkim. Over 1100 numbers have, with the exception of the ferns, already been named. This collection included a new species of *Sedum*, and a new variety of *Primula*, and several Chinese species not previously recorded from India.

Professor E. Barnes has again contributed excellent specimens from Southern India, two or three of which are probably new. Nearly 500 sheets were presented by the Forest Botanical Garden at Maymyo, Burma; many of them were of considerable interest, particularly those collected in the little-known Wa States.

A member of the 1938 Mt. Everest Expedition, Mr. Peter Lloyd, presented over 100 specimens collected during the expedition. Col. F. H. Lister sent 85 specimens collected in Sikkim and Nepal. Mr. F. W. Andrews presented about 100 specimens from the Bombay Presidency, and Capt. R. S. Vine, R.A.M.C., about 300 from the Madras Presidency, mainly collected in the Nilgiris. Lesser contributions from India were received from Mr. R. N. Parker (Punjab),

Mr. P. V. Mayuranathan (S. India), the Imperial Forest Botanist, Dehra Dun, the Agricultural Department, Ceylon and the Forest Botanist, Assam ; many specimens from the last two were, however, for identification and return.

Over 500 specimens were received from the Forest Department, British North Borneo ; the Singapore Botanic Gardens presented nearly 700 named duplicates ; a set of duplicates of the collection made by Dr. W. J. Lütjeharms in South Sumatra was presented by the State Herbarium, Leiden, and a small collection of about 150 Bornean duplicates was received from the Imperial Institute, South Kensington.

The determination of the British North Borneo Forest Department's material has, as last year, been held up in favour of the collection made by the Oxford University Expedition to Sarawak, 1932. It is now evident that, owing to the necessity of borrowing much type material from foreign herbaria, undue delay would result if publication were postponed till the completion of the whole work. The Enumeration referred to in last year's Report will therefore be published by families or groups of families, as identification proceeds.

Publications.—Rain forest in Ceylon, by J. R. Baker (K.B. 1938, 9).

Contributions to the Flora of Siam : Additamenta XLVI to L (K.B. 1938, 24, 98, 127, 199 and 445).

A Note on certain Malayan Species of *Sindora*, by C. F. Symington (Kepong, F.M.S.) (K.B. 1938, 73).

New or little-known plants from S. India : VIII and IX (K.B. 1938, 82 and 123).

Additions to the Flora of Borneo and other Malay Islands : VI, VII, IX and X, by H. N. Ridley (K.B. 1938, 110, 173, 221, 275).

Additions to the Flora of Borneo and other Malay Islands : VIII. *Convolvulaceae* collected by the Oxford University Expedition to Sarawak, 1932, by S. J. van Ooststroom (K.B. 1938, 175).

Plants new to Assam : X (K.B. 1938, 210).

Two New Names in *Aglaia*, by H. N. Ridley (K.B. 1938, 215).

A new *Eugenia* from Assam, by K. P. Biswas (K.B. 1938, 262).

Three new species from Tibet (K.B. 1938, 285).

Notes on *Xylocarpus*, by H. N. Ridley (K.B. 1938, 288).

Contributions to the Flora of Burma : XIV (K.B. 1938, 294).

The Flora of the Lushai Hills, by Cecil E. C. Fischer, published as Vol. XII, No. 2 of the Records of the Botanical Survey of India, in Delhi, but prepared at Kew.

CHINA, JAPAN, FORMOSA AND NORTH ASIA.—Collecting in China has been much restricted owing to war conditions, but in spite of this several important collections have been received during the year. Among these may be mentioned more than three thousand specimens from the Lingnan University, including 2933 specimens from the 8th Hainan Expedition and subsequent collections : a collection made by Miss L. Trotter in Korea in 1937 and received

for identification, as well as 292 specimens collected by Prof. Nilsson-Ehle and Mr. E. Hulten in Siberia and Kamtchatka respectively, received from Stockholm. The Herbarium has further been enriched by the presentation of type material of species of *Gentiana* from Uppsala and the Tokyo Imperial University; the former institution contributed Chinese species described by Dr. Harry Smith and the latter those worked out by various Japanese botanists from Japan, Korea and Formosa which were previously unrepresented at Kew. In a number of instances photographs of the type specimens preserved at Tokyo were also presented. Type specimens of Chinese species of *Aconitum*, *Clematis*, and other genera have been returned from loan by Dr. Handel-Mazzetti, who has also kindly authenticated previously undetermined material.

A large number of new species and varieties of *Gentiana* have been described from Southern Tibet, Bhutan and adjacent regions, and a further paper on the Gentian flora of this region is approaching completion.

Publications. — The *Lilium Davidi*-*sutchuenense*-*Willmottiae* series. By A. Grove and A. D. Cotton. (Lily Year-Book, 1938, p. 26.)

Lilium Davidi var. *unicolor*. By A. D. Cotton (loc. cit. p. 35).

AFRICA.

Whilst the determination of recently gathered material has continued steadily, the absence in Rhodesia of the botanist in charge during the later part of 1937 and the first three months of this year has unfortunately caused some delay in supplying collectors with lists of names. More time than usual has been devoted to the answering of queries, both nomenclatural and taxonomic, and in consequence there has been little rearranging of the African material in the Herbarium, and very little time has been available for research. Several thousand duplicates have been sorted into sets and distributed during the year, large sets going to the herbaria at Berlin, Brussels and Paris. Mounting and incorporation of recently acquired material has proceeded satisfactorily.

Work on the taxonomy of Tropical African plants has now reached the stage when a more complete knowledge of individual species is required. Characters of great taxonomic importance, which are admirably suited for use in floras, cannot be made use of because the necessary information is very seldom supplied on the field labels. For example, herbaceous material is often collected without the rootstock and without information as to the probable duration of the plant. It is most important to know whether a certain herb is an annual or perennial and if a perennial, whether it possesses tubers or thick fleshy roots. In the case of trees and shrubs the taxonomist should know the habit and whether it is evergreen or

deciduous. Many savannah plants flower before the development of leaves, so that, in the herbarium, it is often difficult to correlate material collected at different seasons. By carrying out intensive work in a relatively small area, bearing in mind such points as those mentioned above, the field worker can do much to increase our knowledge, always provided that his material is carefully selected and prepared.

Many collections have been received from the British territories in Tropical Africa during the year but unfortunately much of the material is of comparatively little use on account of poor selection and preservation, and scanty accompanying data. If there is not much time available for collecting it is preferable to concentrate on obtaining a few good specimens rather than a larger number of poorly prepared ones.

WEST TROPICAL AFRICA.—Comparatively little material has been received from the area covered by the "Flora of West Tropical Africa" during the year, yet a few records of species not included in the Flora have been obtained. Much of the material received from this area suffers from improper drying and is of little value. The use of artificial heat in places where the rainfall is heavy and the humidity is high is strongly recommended.

About 80 specimens collected by Mr. F. C. Deighton, with useful notes, have been received from the Department of Agriculture, Sierra Leone. The Gold Coast Forestry Department sent about 75 specimens for naming, and a quantity of specimens from Nigeria, collected mainly by Mr. W. R. Elliott towards the beginning of the century, were presented by the Imperial Institute. About 50 named duplicates of Liberian plants were presented by the Arnold Arboretum.

The most interesting acquisition was a duplicate sheet of the type gathering of *Pitcairnia Feliciania* (Chev.) Harms & Mildbr., presented by the National Natural History Museum, Paris, being the first record for a species of *Bromeliaceae* from the African continent.

Work on the Additions to the "Flora of West Tropical Africa" has been continued by Dr. Hutchinson.

CAMEROONS AND CONGO.—In continuation of exchange, about 500 named specimens from the Belgian Congo were received from the State Botanic Garden, Brussels. These are a very valuable addition to our collections from the Congo, as the consignment contains many species not previously represented at Kew.

NORTH-EAST TROPICAL AFRICA.—A fine collection from the southern Anglo-Egyptian Sudan, consisting of about 500 numbers, was received for naming from Mr. J. G. Myers. Some further gatherings of water plants, several preserved in liquid, were received through Mr. F. W. Andrews of the Sudan Agricultural Research Service, who is making a study of the water-weeds of canals in the Sudan. Apart from grasses and a few specimens from western Abyssinia, collected by Capt. E. Erskine, nothing else was received from this area during the year.

EAST TROPICAL AFRICA.—The Officers of the Uganda Department of Agriculture collected several hundred specimens, the collections, as usual, resulting in many new records for the Protectorate and additional material of some poorly represented or little known species. Many gatherings were supplemented by material in liquid preservative, a form of collecting which is of very great help to the taxonomist and which is at present but rarely adopted. The largest of these collections was made by Mr. P. Chandler, whilst others who contributed were Mrs. Tothill, Mr. C. Hazel, and Mr. J. W. Purseglove. Further useful collections came from Mr. W. J. Eggeling and other Officers of the Forestry Department. Much time has been spent during the year in verifying some of the earlier identifications of Uganda plants at the request of Mr. Eggeling, who is anxious to make as accurate as possible the "Descriptive List of Uganda Trees and Shrubs" which is under preparation by the Forestry Department.

Several hundred specimens, contributed by various collectors and received from the Coryndon Memorial Museum, Nairobi, Kenya Colony, were unfortunately considerably below the standard of previous consignments on account of the poor preservation of the material. Useful collections, mainly of woody plants and including several rare species, were received from the Kenya Forestry Department. Other collections came from Mrs. D. R. Tweedie, Miss D. C. Mainwaring, and the Kenya Veterinary Research Laboratory. Mrs. C. G. Rogers presented over a thousand named plants collected by the late Mr. C. Gilbert Rogers mainly in Kenya Colony.

The most interesting collection of Tanganyika plants received during the year consisted of over 300 plants from Mafia Island collected and named by Mr. P. J. Greenway and presented by the East African Agricultural Research Station, Amani. This institution presented for naming a further 450 specimens of Tanganyikan plants, whilst about 100 specimens were received from the Department of Agriculture. A small but interesting collection was received from Mrs. H. E. Hornby, and Mr. A. P. G. Michelmores presented a further collection of nearly one hundred gatherings from near Lake Rukwa. Some valuable duplicate type material was kindly presented by the Berlin Botanical Museum.

SOUTH TROPICAL AFRICA.—Further useful collections were received from Sr. A de F. Gomes e Sousa collected in Portuguese East Africa, and from Mr. J. Gossweiler, collected in Angola whilst he was accompanying the British Museum Expedition in 1937. Both Mr. C. G. Trapnell of the Department of Agriculture, Northern Rhodesia, and Mr. A. P. G. Michelmores presented collections from Northern Rhodesia for naming. Mr. Milne-Redhead's expedition to Northern Rhodesia, made possible by assistance from the Bentham Moxon Trustees and by the generosity of Capt. K. R. Paterson, resulted in the acquisition of over 2100 gatherings,

300 of which were obtained in the Mexico District of Angola. This collection is fairly rich in duplicate material. Additional material of several rare or little-known plants found by Mr. Milne-Redhead has since been collected by Capt. Paterson. Over 300 specimens have been received from the Department of Agriculture, Nyasaland, collected by Mr. E. Lawrence and Mr. J. E. L. Fenner. About 50 specimens from Southern Rhodesia were presented for naming by the Transvaal Museum, whilst the National Herbarium, Pretoria, forwarded for verification nearly 200 plants collected by Mr. J. Erens on Dr. Pole Evans's recent trip to Ngamiland. About 100 miscellaneous duplicates were presented by the Imperial Forestry Institute, Oxford.

MASCARENE ISLANDS.—A collection of over 100 specimens, many of them representing rare endemic species, were collected by Mr. D. V. Fitzgerald in Seychelles and presented by the Department of Agriculture.

SOUTH AFRICA.—The most outstanding acquisition of recent years was the South African herbarium of Mr. S. Garside, which was purchased by the Bentham-Moxon Trustees during the year. The specimens number over 2500 and represent some of the best preserved South African plants ever received at Kew. Mr. Garside's careful notes and accurate drawings add greatly to the value of the herbarium, which is very rich in *Proteaceae*, and was formed from collections made mainly in the Cape region. In addition, Mr. Garside deposited at Kew, on loan, his spirit collection which supplements his herbarium.

Several hundred specimens were received from the National Herbarium, Pretoria, for naming or verification, and contained many useful additions to the Herbarium. Over 50 specimens were presented for naming or verification by the McGregor Museum, Kimberley, over 100 each by the Bolus Herbarium, Natal Herbarium and Captain T. M. Salter.

Dr. H. G. Schweickerdt was visiting botanical institutions on the Continent from April to September, and returned to Pretoria in October. Mr. D. G. Collett, who is succeeding Dr. Schweickerdt as Botanist for South Africa at Kew, arrived in September and has been occupied with routine naming of recent South African specimens, received chiefly from the Division of Plant Industry, Pretoria. The paper on "A new Conception of the genus *Ammocharis* Herb." by Mr. Milne-Redhead and Dr. Schweickerdt was finally completed and will be published in due course.

Publications.—On the Synonymy and Distribution of *Strychnos innocua* Del. (K.B. 1938, 45).

Euphorbia (*Diacanthium*) *Deightonii*, a new Succulent from West Africa, with brief notes on some Allied Species, by Leon Croizat (K.B. 1938, 53).

Notes on *Mesembryanthemae*: II. The Lectotypes of *Nananthus* and *Aloinopsis* (K.B. 1938, 153).

Meerburgh's *Impatiens capensis* (K.B. 1938, 161).

Notes on African Rubi in the Kew Herbarium, by C. E. Gustafsson (K.B. 1938, 177).

Notes on *Carex*: IV. The Section *Elatae* in Tropical Africa (K.B. 1938, 242).

AMERICA.

During the year 10,550 sheets were mounted, and about 4760 were laid in, as well as 250 photographs.

The Botanist in charge of the section spent much of his time on the identification of the collections made by him in British Guiana and Tobago, and the work, including the distribution of duplicates, was nearly completed. Small but valuable consignments of specimens collected by the Forest Department of British Guiana were also examined^d, while further time was spent in critically naming the Trinidad material of certain families with a view to the publication of another part of the Flora of Trinidad and Tobago. Other collections examined include those of the "Cap Pilar" Expedition (mainly in the Galapagos and Cayman Islands), a small consignment from Mrs. F. A. Sharpe from southern Peru, and the large and very valuable Peruvian collection of Miss Dora B. Stafford. A series of plants from Barbados was named for Dr. A. E. S. McIntosh, who is making a thorough investigation of the flora of this island. The Botanist also dealt with several interesting parcels of *Bignoniaceae* which were forwarded for identification from institutions in Brazil and Argentina.

The Assistant Botanist, who deals with all botanical questions relating to North and Central America, continued to be much occupied with the Mexican collections of Mr. G. B. Hinton, whose numbers now approach 13,500. Work has also begun on another large collection, comprising over 1600 specimens, made in Central Mexico last year by Mr. E. K. Balls and Dr. W. B. Gourlay. He also completed the identification of plants received during the year from Greenland collected by Lord Rossmore, of others from Newfoundland collected by Mr. T. R. G. Moir, and Mr. C. C. Cholmondeley's Labrador collection.

Apart from the important collections of Mr. Hinton, Mr. Balls and Dr. Gourlay, and Miss Stafford, special mention should be made of a duplicate set of the collection made by the Cambridge University Expedition to British Guiana in 1933 (coll. Mr. T. G. Tutin), presented by the British Museum (Natural History); of nearly 300 specimens collected by Mr. Christopher Sandeman on a recent expedition to little-explored areas of Amazonian Peru; of duplicates of plants from the Terry-Holden Expedition to the far interior of British Guiana in 1937-38 (coll. A. C. Smith), presented by the New York Botanical Garden; and of a valuable set of about 400 named duplicates of Amazonian plants collected by Dr. A. Ducke, received through the Ministry of Agriculture, Rio de Janeiro.

Other collections received during the year include :—

NORTH AMERICA.—*Presented*: By Arnold Arboretum (from California); University of California, Berkeley (California); California Academy of Sciences, San Francisco (California); Gray Herbarium (Cent. 8 of "Plantae Exsiccatae Grayanae," and plants from Nevada and Virginia); Mr. T. R. G. Moir (British Columbia and Alberta); Montana State University (Virginia); Dr. F. A. Rodway (California); Stanford University (California); Rev. and Mrs. H. A. Turner (Baffin Land). *Purchased*: From Dr. Aven Nelson, Wyoming University (Arizona).

CENTRAL AMERICA.—*Presented*: By Arnold Arboretum (Costa Rica); University of Colorado (Mexico and Lower California, coll. J. A. Ewan); Mr. H. H. Haines (Mexico and Lower California); Mr. C. H. Lankester (Costa Rica); Stanford University (Mexico and Lower California). *Purchased*: From Mr. F. Lyle Wynd (Mexico); Prof. E. Lyonnet (Mexico), Mr. C. L. Lundell (British Honduras and Mexico); Dr. A. F. Skutch (Costa Rica).

WEST INDIES.—*Presented*: By Director of Agriculture, Barbados (Barbados); Mr. C. Mathews (Bahamas); Mr. N. Y. Sandwith (Tobago); Department of Agriculture, Trinidad (Trinidad).

EAST TROPICAL S. AMERICA.—*Presented*: By Botanical Museum, Utrecht (Surinam); British Guiana Forestry Dept. (British Guiana, coll. Major A. Beddington, Br. Guiana Boundary Commission); Field Museum, Chicago (Trop. America); Gray Herbarium (Brazil); Museo Nacional, Rio de Janeiro (Brazil). *Purchased*: From Field Museum, Chicago (Brazil, coll. Mrs. Ducke).

WEST TROPICAL S. AMERICA.—*Presented*: By United States National Museum, Washington (Peru, Colombia, etc.).

TEMPERATE S. AMERICA.—*Presented*: By Buenos Aires Faculty of Agriculture (Argentina, coll. Dr. Arturo Burkart); Señor A. Cabrera (Argentina); Museo Argentino, Buenos Aires (Argentina, *Bignoniaceae*); University of Tucuman (Argentina).

Publications:—*Penstemon campanulatus* and *P. Kunthii* (K.B. 1938, 1).

Contributions to the Flora of Tropical America: XXXIV–XXXVII, comprising:—*Plantae Hintonianae*: VI. *Acanthaceae* (K.B. 1938, 59). *Plantae Hintonianae*: VII. Further notes on the Genus *Bursera* (K.B. 1938, 163). *Plantae Hintonianae*: VIII. New Mexican *Gesneriaceae* (K.B. 1938, 292). Notes on the Flora of Tobago (K.B. 1938, 353).

The Botanical Name of the Douglas Fir (K.B. 1938, 79).

Notes on a Botanical Journey in S.W. Greenland, 1937, by Dr. Nicholas Polunin (K.B. 1938, 89).

A Synopsis of the Labiatae of the Guianas, by Carl Epling (K.B. 1938, 187).

Neoporteria and *Chilenia* (K.B. 1938, 296).

Chileniopsis and *Bridgesia* (K.B. 1938, 300).

Binghamia, *Haageocereus* and *Pseudoespostoa* (K.B. 1938, 454).

Pedilanthus versus *Tithymalus* (K.B. 1938, 468).

Three new South American plants (*Brittonia*, 3, 91–94).

AUSTRALIA AND NEW GUINEA.

During the year it has been possible to keep up to date with the mounting and incorporating of material received and to deal with most of the outstanding accumulations.

Mr. C. A. Gardner continued his investigations of Western Australian plants, in the course of which he presented a further 1000 duplicates to the Kew Herbarium. These are a continuation of those mentioned in last year's report and include many rare or little-known species. Most of these have already been incorporated.

Collections were also received from Mr. C. T. White (Botanical Museum, Brisbane); Mr. S. T. Blake (Queensland *Cyperaceae*); the North Queensland Naturalists' Club; Mr. H. H. Haines (Queensland plants); the National Herbarium, Sydney; Dr. F. A. Rodway (New South Wales and Tasmania), and from Mr. B. T. Lowne.

In New Guinea work has been concentrated on *Ficus*, of which over 200 gatherings are being studied, including those collected on the two Archbold Expeditions and by the late Mr. C. E. Carr. There is much still to be discovered regarding the genus in this region and collections of these very characteristic and easily recognizable plants would be welcome. It should be emphasized that the specimens must bear figs, or identification is difficult or impossible. Details of the method of collection will be furnished to anyone interested.

NEW ZEALAND AND OCEANIA.

Little active work has been carried on in these regions. Dr. H. H. Allan continued to send material of rare or interesting New Zealand plants, while Mr. H. H. Haines presented a collection from the same country.

Further material of *Ficus* from Oceania was presented by the Bernice P. Bishop Museum, Honolulu, for critical study. A paper on the genus *Ficus* in Samoa has been prepared for publication, and will appear shortly in the "Occasional Papers" of the Bernice P. Bishop Museum. Work is being continued on the genus both in Fiji and in Tonga, as well as on several large collections from the Solomon Islands. The Musée d'histoire naturelle, Paris, presented some duplicates from New Caledonia.

ORCHIDACEAE.

As in previous years, a large proportion of the work has been the routine naming of small collections of orchids from all parts of the world. Many living plants from the Gardens have also been studied, while the receipt of spirit material from many collectors has permitted greater accuracy in determination, as well as providing valuable material for comparative study.

Valuable collections of orchid duplicates from Central America and the Philippine Islands were received in exchange from the Botanical Museum, Harvard University.

African collections still provide the greatest amount of work and research on these is being continued. The genus *Polystachya* in particular is being studied critically, since the only monograph available is already out of date. Other groups being specially studied are *Habenaria* and the *Angraecoids*, in both of which much work is still necessary before even a satisfactory general classification can be put forward.

Messrs. J. K. Cox and G. S. Cansdale of the Gold Coast Agricultural Department continued to send material of West African orchids, while contact has been made with several orchid-growers in Kenya Colony. It is hoped that close co-operation with these enthusiasts, who are growing the native species on a large scale, will be an important factor in writing up the *Orchidaceae* for the projected East African Flora.

Research has also been continued on the orchids of India, Burma and Indo-China.

Publications.—African Orchids : X (K.B. 1938, 141).

GRAMINEAE.

Numerous collections of grasses have been received for determination during the past year. They have included a greater proportion of British grasses than usual, due no doubt to the preparation of several local floras and the new British Flora. Over 2500 specimens from the British Empire and foreign countries have been named, comprising valuable collections from Cyprus, Asia Minor, Arabia, Tropical and South Africa, India, Mexico, West Indies and Australia. In addition to the work of naming, reports on economic grasses for various purposes, information on sources of seed-supply, notes on nomenclature, and other problems connected with grasses, have been prepared. The nomenclature of grasses has been checked for the new edition of the List of Herbaceous Plants cultivated at Kew. The preparation of the next part of the Flora of Tropical Africa has been continued, as well as the revision of several genera of Australian grasses, whilst an account of the grasses of Mauritius is almost completed. Thanks to additional assistance it has been possible to rearrange several genera according to recent monographs, to incorporate in the Herbarium about 3500 specimens, and to distribute 710 duplicates to other herbaria.

Miss J. W. Vickery and Mr. C. A. Gardner continued their studies of N.S. Wales and West Australian grasses respectively. Mr. J. E. Senaratna of Peradeniya, Ceylon, finished his revision of *Leptaspis*, but owing to illness he was unable to complete the remainder of his account of the *Phareae*. Mr. A. S. McKinnon spent a few weeks examining grasses from British Somaliland before proceeding to that country. Dr. H. G. Schweickerdt continued his investigations of the types of South African grasses preserved at Kew, fragments

of which have been presented to the National Herbarium, Pretoria. Amongst other visitors were Miss L. Chippindall (Pretoria) and Mr. Wm. G. Dore (Nova Scotia), who each spent a few days in the Herbarium studying grasses. Miss J. Wilton and Mr. W. Hartley gave valuable assistance in various ways connected with routine work on the *Gramineae*.

Most of the general collections contained a varying proportion of grasses, but a considerable number entirely or mainly composed of these plants have also been received. The more important of these are listed below :—

Europe :—British Isles (Mr. J. P. M. Brenan, Mr. F. Druce, Mr. H. B. Johnston, and members of the Kew Staff) ; France (Dr. M. Bouly de Lesdain) ; Sweden (Botanical Museum, Lund). *Asia* :—Arabia and Kurdistan (Mr. H. E. Bellringer) ; India, etc. (Wellcome Research Laboratories) ; Central Provinces, India (Dr. G. H. Bhatia). *Africa* :—Nigeria (Department of Agriculture) ; British Somaliland (Veterinary and Agricultural Department) ; Uganda (Agricultural, Forestry and Veterinary Departments) ; Tanganyika Territory (E. African Agricultural Research Station) ; Nyasaland (Agricultural and Veterinary Departments) ; Northern Rhodesia (Department of Agriculture) ; Mauritius and Rodriguez (Dr. R. E. Vaughan). *Australia* :—Queensland (Mr. S. T. Blake) ; N.S. Wales (National Herbarium, Sydney ; Mr. R. A. Black) ; Western Australia (Department of Agriculture). *America* :—United States (Department of Agriculture) ; Argentine (Prof. L. R. Parodi) and Cuba and Hispaniola (coll. Ekman, purchased from Stockholm).

Publications :—Hook. Ic. Plant. tt. 3361–5.

PTERIDOPHYTA.

Work on the new edition of the “ Handlist of Ferns in Cultivation at Kew ” was continued, and it is hoped to publish it shortly. No special collections of ferns were received during the year, though a fair number of specimens were forthcoming from general collections, notably those of Mr. G. B. Hinton of Mexico and various collectors in tropical Africa.

Much time was spent in revising the herbarium material of the *Ophioglossaceae* and *Marsilia*, with special reference to the Indian species. The work was necessary in order to supply certain Indian correspondents with accurate distributional data. During the year 1400 sheets were incorporated, while many more have been sorted into genera and arranged in special cabinets.

Dr. T. M. C. Taylor, of the University of Toronto, spent several months working on the American species of the genus *Woodsia*.

BRYOPHYTA AND CHAROPHYTA.

Series 5 and 6 of Dr. Verdoorn’s “ *Musci selecti et critici*,” and Series 6 of “ *Hepaticae selectae et criticae* ” have been purchased. An important set of 100 Mosses of Iowa has been presented by

Professor Conard of Grinnell College, Iowa, as well as Series A, "Bryophytes of the French Colonial Empire" by the Laboratoire de Cryptogamie, Paris and some 60 named *Musci* by the Natural History Museum, Vienna. A number of small consignments received during the year, particularly of *Hepaticae*, among general collections from Tropical Africa, have been identified. Mr. H. N. Dixon and Mr. G. O. Allen have kindly continued their co-operation in the naming of *Musci* and *Charophyta* respectively.

Ecological observations on the Bryophytes from the niveal zone in the Alps of the Dauphiné, Bernese Oberland, and Matterhorn, have been continued, and a specially selected series of specimens has been placed in the Herbarium. A paper has been prepared on new records of Bryophytes from Harris, in the Outer Hebrides.

Among unusual specimens received during the year 1938 was a moss (*Nekera complanata*) stated to have been the material employed for caulking a prehistoric dug-out canoe discovered on the shore of the Humber.

The Card Index belonging to the British Bryological Society is now housed in the Herbarium under the charge of Mr. C. V. B. Marquand as Hon. Bibliographer of the British Bryological Society.

FUNGI.

Early in the year it became obvious that thorough and drastic treatment of the collections was necessary if irreparable damage by beetle attack was to be avoided. Accordingly it was decided to pass the whole of the *Basidiomycetes*, which is the group most affected, through the fumigation chamber. This has now been accomplished except for one block of cabinets, and the work involved considerable expenditure of time, as all packets and boxes had to be opened to allow of the penetration of the gas. At the same time the cupboards were brushed out with corrosive sublimate solution, particular attention being paid to crevices. It is hoped that in this way all beetles already existing in the cabinets will have been destroyed. Further introductions should be avoidable by the routine fumigation of all new material which now takes place.

Accessions to the mycological collections included a valuable set of 96 specimens of the genus *Septobasidium*, presented by Mr. T. Petch, and a first set of fungi of the French Colonial Empire, presented by the Laboratoire de Cryptogamie, Paris. Mr. C. G. Hansford has continued to send microfungi, both named and unnamed, from Uganda, and 66 specimens were received for naming from the South African Department of Agriculture, Pretoria.

A considerable amount of duplicate material, including co-types of many species of *Meliolineae* described by Mr. Hansford, was distributed from Kew to various herbaria, including those at Berlin, Paris, Stockholm, the Farlow Herbarium and the herbarium of the United States Department of Agriculture.

Miss Wakefield attended both the spring and autumn forays of the British Mycological Society, where besides the collection of

specimens of fungi for the Herbarium and for exchange, opportunity was taken to make coloured drawings likely to be useful for the Herbarium collection and for inclusion in the Ministry of Agriculture's Bulletin on edible and poisonous fungi.

Routine work has as usual included replies to many and varied questions about fungi, diseases caused by them, nomenclature, and books.

ALGAE AND LICHENS.

A further contribution of seaweeds from the New York Botanical Garden, including a quantity of specimens from the herbarium of F. S. Collins and miscellaneous algae from the general herbarium, has been received. Dr. F. Børgesen continues to supply material from his own collections, the last instalment being a number of marine algae from India, which have been described in three papers under the title "Contributions to a South Indian Marine Algal Flora."

About 2500 cards have been incorporated in Tilden's Index *Algarum Universalis*.

Loans to outside workers have included all the material available from particular geographical areas. In connexion with this type of work several bibliographical questions and enquiries have been received about little-known collectors whose names appear on Kew sheets.

Several collections were sent for naming, the largest being from Western Australia. Smaller sets included material from Queensland, New Zealand, South Africa and the British Isles.

Fascicles 4 to 7 of "*Lichenes Fenniae Exsiccati*" have been mounted and laid in to the Herbarium. Numerous small collections have been received for determination.

SPIRIT COLLECTION.

The number of bottles incorporated this year is 674, which maintains the high average of the last few years. With the collection becoming more fully representative of the various groups, its value is rapidly increasing. The most valuable collection received during the year was about 700 gatherings made by Mr. Milne-Redhead during his stay in Northern Rhodesia. This represents about one-third of his total gatherings, most of the spirit material being duplicated by dried specimens. The spirit material is particularly rich in Orchids and Monocotyledons generally but other families such as *Asclepiadaceae* are also well represented. Supplementary spirit collections of some of the orchids have since been received from Capt. K. R. Paterson, with whom Mr. Milne-Redhead stayed during his visit.

Another very important addition has been a series of *Stapelieae* grown by Mr. B. L. Sloane at Pasadena, California, and presented by him and Mr. Alain C. White. This includes flowering stems from type plants of species described by the above two specialists in *Stapelieae*, and also authentic material of many other species.

Several collections of water plants have been received from East Africa. Such material retains many valuable diagnostic characters which are lost during the preparation of dried specimens, and spirit or formalin material of water plants will be welcomed from any sources. It is important that the specimens should be in flower (and fruit if possible) when collected.

Recent work has shown the value of spirit preservation of flowers and fruits of *Annonaceae*, in which important diagnostic characters disappear during drying. Collectors are urged to preserve material from this family whenever possible.

Material of thirteen previously unrepresented orchid genera were added during the year, including the comparatively rare genera *Aphyllorchis*, *Cymbidiella*, *Cirrhaea*, *Diplocentrum*, *Josephia*, *Amparoa* and *Menadenium*.

Mr. S. Garside has recently placed his very valuable collection of spirit material of South African plants on permanent loan to Kew. This includes many rare *Proteaceae* and other plants, and comprises not only flowers, etc., but also stems and leaves suitable for anatomical investigation.

EXPERIMENTAL AND TRANSPLANT WORK.

Genetical research was continued at the Potterne Biological Station and at Kew on *Silene*, *Centaurea*, *Ranunculus*, and *Saxifraga*.

The experiments with *Silene* included numerous stocks from a wide range of localities and from diverse habitats. The investigation of the numerous genes involved in both interspecific differentiation and intraspecific variation is proving exceptionally interesting, though difficult. Many of the characters are due to the definite interaction of several genes, and a complicated system of crossing and back-crossing is sometimes essential for the elucidation of the problem of "variation" in the plants used. In *Centaurea* the whole of the F_2 and some of the F_3 families have now been scored. It is hoped to complete the scoring of the F_3 families in 1939. Mr. E. M. Marsden-Jones is continuing research at Potterne on *Anagallis* (with Prof. F. E. Weiss), on *Solanum Dulcamara*, and on interspecific crosses in *Epilobium*. Investigation of the apomicts and variations of *Taraxacum* was continued at Kew. A considerable amount of research, especially anatomical and physiological, on this genus was carried out by Miss W. Curtis, B.Sc. A large number of species of known wild origin, from the Balkan Peninsula, Cyprus, and elsewhere, was studied in the Herbarium Experimental Ground at Kew. Developmental stages, with abundant living material, were observed and recorded throughout the year. Valuable material was obtained for the Herbarium, especially of *Caryophyllaceae*, *Sempervivum*, and *Fritillaria*. Mr. J. R. Sealy is carrying out experiments on the germination and early stages of seedling growth of *Arbutus*.

The Transplant Experiments of the British Ecological Society at Potterne entered the second decade of their existence. Their

value both to ecologists and to taxonomists is indicated in the summary of ten years' results recently published.

Publications.—Taxonomy and Genetics (Journ. Bot. **76**, 33 : 1938).

Researches on *Silene maritima* and *S. vulgaris* : xxi (K.B. 1938, 248).

Ecological Isolation (K.B. 1938, 384).

Problems of British Taraxaca (Proc. Linn. Soc. 150th Session, 120 : 1938).

Material for a study of Taxonomic Problems in *Taraxacum* (B.E.C. 1937 Report, 570 : 1938).

The expansion of Taxonomy with special reference to Spermatophyta (Biological Reviews, **13**, 342 ; 1938).

Further Interspecific *Saxifraga* hybrids (Journ. Genetics, **36**, 431 : 1938).

Fifth Report of the Transplant Experiments of the British Ecological Society at Potterne, Wiltshire (Journ. Ecol. **26**, 359 : 1938).

Transplant Experiments of the British Ecological Society at Potterne, Wiltshire, Summary of Results, 1928-37 (Journ. Ecol. **26**, 380 : 1938).

SEED COLLECTION.

The laying in has been kept up to date, though only about 30 additional boxes have been added to the general collection. Visitors and members of the staff have made considerable use of the collection for the determination or verification of samples of fruits and seeds. Tropical families are still very poorly represented, and sets of authentically named seeds from the tropics would be much welcomed.

SUMMARY.

The routine work, apart from naming, accomplished during 1938, is summarised as follows :—

Mounted	...	...	...	...	...	50,700*
Incorporated	...	...	...	...	...	47,000*
Duplicates distributed	...	...	...	...	...	16,450
Specimens received on loan	...	...	...	...	...	6590
Specimens sent on loan	...	...	...	...	...	7176
Specimens presented or purchased	...	...	...	...	...	52,885

* Not including lower cryptogams.

POISON CHAMBER.

The chamber was in continuous use during the year, and 29 fumigations were carried out. In addition to the treatment of all incoming collections, including borrowed specimens and material brought by visitors, many thousands of sheets showing traces of beetles were taken out and passed through the chamber. These included the genera *Meconopsis*, *Iberis* and *Iris*, besides material belonging to the families *Araliaceae*, *Capparidaceae* and *Compositae*.

A special collection of *Centaureas* was also treated, besides several thousand specimens of fungi (*Basidiomycetes*).

DRAWINGS, PHOTOGRAPHS AND PORTRAITS.

The large number of drawings and photographs which have been received during the year have been placed in the collection of drawings, or, if photographs of types, have been laid into the Herbarium. They include the following presentations: 62 water-colour drawings prepared for the Botanical Magazine, 9 photographs and one pen-and-ink drawing, from the Royal Horticultural Society; 40 plates of the "Flowering Plants of S. Africa" from Dr. Pole Evans; 120 photographs of Calcutta Botanic Gardens from Lt.-Col. A. T. Gage; 80 photographs of *Aloë* species from Mr. H. Basil Christian; 25 original pen-and-ink drawings of plates (3176-3200) for Hooker's *Icones Plantarum*, and 25 copies of plates (3351-75) from the Bentham Trustees; 10 water-colour paintings by Mrs. Crossman presented by Mr. R. N. Salaman; 1128 water-colour paintings of fungi, etc. by the late Dr. Henry Clarke, presented by Miss Gladys T. Clarke; 24 photographs of types of *Lomariopsis* from Mr. R. E. Holttum; 19 photographs of types of *Brachystegia* presented by the Imperial Forestry Institute, and 15 photographs of types of *Gentiana* from Tokyo Imperial University. About 400 photographs of types—largely of *Piperaceae*—were also received, in exchange, from the United States National Herbarium, and a portrait of Sir Joseph Banks and an old print of Chelsea Physic Garden from Dr. F. Dawtrey Drewitt. In addition a large number of drawings and photographs, including some portraits of eminent botanists, were received from various sources.

INDEX KEWENSIS.

The year 1938 records the publication of Supplement 9, in the preparation and proof-reading of which the Index staff has been mainly occupied. The Supplement appeared during the last week of December, an advance copy having been received at Kew on December 6th. Compared with Supplement 8 the recent Supplement shows an increase of 49 pages. This is probably due, partly to an increase in the number of new species and transferences made during the quinquennium, and partly to the inclusion within the Supplement of many works of earlier date which were omitted from the original Index and its Supplements. Attention may be drawn to the Preface where certain alterations in the form of entry are explained. Double citations are now supplied in accordance with Article 49 of the International Rules of Botanical Nomenclature: "When a genus or group of lower rank is altered in rank but retains its name or epithet, the original author must be cited in parenthesis, followed by the name of the author who effected the alteration. The same holds when a subdivision of a genus, a species, or a group of lower rank, is transferred to another genus or species with or without alteration of rank." This modification in the form of entry

in Supplement 9 of the Index Kewensis, although it has materially added to the work of compilation, will undoubtedly be greatly appreciated by all workers. All hybrids are so indicated by the sign \times placed before the name. In former Supplements hybrids were indicated by the abbreviation "hybr." placed after the date following the citation. The new method, besides being in accordance with the International Rules, shows at a glance which names are those of hybrids as opposed to those of species. In the original Index and its Supplements up to Supplement 8 it was customary to place a comma between the botanical name and the name of the author. In Supplement 9 the comma has been omitted.

Great care has been taken during the preparation of Supplement 9 to distinguish generic homonyms so that all specific names are placed under the correct generic name and family. As in Supplements 7 and 8, a list of new generic names arranged under their families in alphabetical order is included at the end of the work (pp. 303-305). The Supplement is published by the Clarendon Press and as usual maintains the high standard of work of that Institution.

The compilation of Supplement 10 (1936-40) is well in hand with about 7000 entries in the Card Catalogue, which are available for consultation.

NOMENCLATURE, BIBLIOGRAPHY AND HISTORY OF BOTANY.

During the past year a large number of nomenclatural enquiries has again been received. In addition to this, several lists of names have been received with the request that they should be corrected according to International Rules; these have often involved both nomenclatural and taxonomic investigation. Arising from such routine work, papers dealing with particular nomenclatural investigations have been published. During the early part of the year some time was spent on proof-reading the late Sir Arthur Hort's translation of "The Critica Botanica" of Linnaeus, revised by Miss M. L. Green, which has been published by the Ray Society. The "Critica" is interesting in throwing light on the nomenclatural views of Linnaeus before he wrote his "Species Plantarum" in 1753, and may be considered as the first set of "rules" of botanical nomenclature. In June the "Handlist of Coniferae, Cycadaceae and Gnetaceae cultivated at the Royal Botanic Gardens, Kew, and at the National Pinetum, Bedgebury" appeared, and the nomenclature has been brought into line with the International Rules as amended at Cambridge and Amsterdam. During August Dr. T. A. Sprague and Miss M. L. Green attended the nomenclatural meetings of the Twelfth International Horticultural Congress held in Berlin. It was generally agreed that the list of the correct names of economic plants decided upon at the International Botanical Congress at Amsterdam, would be very valuable, and it is hoped that special attention will be paid to the preparation of this list during the coming year. As Secretary of the Special Committee

for Phanerogamae and Pteridophyta, Miss Green has prepared a list of nomina conservanda as voted upon by the members of the Committee. This list has been submitted to Professor Harms, Chairman of the Executive Committee, by whom it will be edited and inserted in the Supplement to the International Rules, Ed. 3, which it is hoped will be published shortly.

The correct authority and the effective date of publication of the name *Nicotiana Langsdorffii* were investigated on the suggestion of Dr. T. H. Goodspeed, and it was found that this name had been published independently by different authors, using different type material, in 1819, 1820 and 1821. The dates of publication of the first three volumes of Harvey and Sonder's "Flora Capensis" were also investigated.

An account of Hermann Boerhaave's botanical work and attainments was prepared in connexion with the commemoration at Leyden, on September 23rd, 1938, of the two-hundredth anniversary of his death. It was found that while there is little that was original in Boerhaave's system of botanical classification he possessed considerable morphological acumen and sound taxonomic judgment, and that his generic descriptions were excellent.

Publications.—Nomenclature : On the synonymy and distribution of *Strychnos innocua* Del. (K.B. 1938, 45).

On the validity of the name *Solidaster* (*Chronica Botanica*, 1938, 4, 36-39).

The botanical name of the Douglas Fir (K.B. 1938, 79).

New Conifer Names (K.B. 1938, 85).

The lectotypes of *Nananthus* and *Aloinopsis* (K.B. 1938, 153).

The correct name of the Common Parsley (K.B. 1938, 256).

The XIIth International Horticultural Congress (*Nature*, 1938, Sept. 17, 544-545).

Neoporteria and *Chilenia* (K.B. 1938, 296).

Chileniopsis and *Bridgesia* (K.B. 1938, 300).

Binghamia, *Haageocereus* and *Pseudoespostoa* (K.B. 1938, 454).

Pedilanthus versus *Tithymalus* (K.B. 1938, 468).

On the correct names of three European species of *Cirsium* (*Fedde, Repert.* 43, 302-315 : 1938).

History of Botany.—Boerhaave as a Botanist (*Nederl. Tijdschr. voor Geneeskunde*, 82, no. 40, 4891-4 : 1938 ; reprinted in "Memorialia Hermann Boerhaave optimi medici," Haarlem : 1939).

VISITORS.

The number of visitors in the Visitors' Book for the year 1938 was 4770. This shows a slight decrease compared with 1937.

The following kindly gave voluntary assistance in the Herbarium :—Mr. H. N. Ridley again helped in naming Malayan specimens, and Miss M. M. Whiting in arranging and classifying the Indo-Malayan material ; Miss F. Hamilton has given very considerable assistance with genetical-statistical studies on *Saxifraga granulata* from wild material collected on the Hogs Back, Guildford

and from plants bred from this material. Miss June Burroughes has given assistance throughout most of the year in naming European collections and in re-classifying material from this area in the Herbarium, and latterly Mr. Ogilvie Grant has kindly assisted with similar work.

Amongst frequent or regular visitors were members of the staffs of the Department of Botany, British Museum (Natural History), the Imperial Mycological Institute, and the Imperial Forestry Institute, Oxford. The Staff employed by the Royal Horticultural Society in connexion with the preparation of the "Index Londinensis" and "The Botanical Magazine" have worked in the Herbarium and Library throughout the year.

The most noteworthy or frequent visitors to the Herbarium were the following :—

Prof. R. S. Adamson (Cape Town) ; Revd. L. W. A. Ahrendt ; Mr. A. H. G. Alston ; Mr. G. H. J. Amshoff (Utrecht) ; Dr. E. Asplund (Stockholm).

Mr. E. G. Baker ; Miss Ella M. Barnes ; Miss E. C. Barnett ; Mr. W. J. Bean ; Dr. G. R. Bisby ; Mr. J. P. M. Brenan ; Prof. A. H. R. Buller (late of Winnipeg) ; Mr. I. H. Burkill ; Miss J. Burroughes.

Mr. K. St. G. Cartwright ; Mr. D. Chatterjee ; Prof. E. E. Cheesman (Trinidad) ; Mr. C. Chevalier (Liège) ; Miss L. Chippindall (Pretoria) ; Dr. C. Christensen (Copenhagen) ; Dr. Charles Chupp (Ithaca, New York) ; Miss L. v. W. Claterbos (Leiden) ; Dr. Leon M. Croizat (Harvard).

Dr. J. M. Dalziel ; Mr. J. E. Dandy ; Prof. B. H. Danser (Groningen) ; Mr. P. M. Dansereau (Montreal) ; Mr. F. C. Deighton (Sierra Leone) ; Mr. H. N. Dixon ; Mr. Wm. G. Dore (Nova Scotia) ; Mr. H. L. Dunkley.

Mr. A. W. Exell.

Mr. G. St. C. Fielden ; Mr. R. M. Fiennes (Entebbe, Uganda) ; Dr. L. Fraser (Sydney) ; Prof. R. E. Fries (Stockholm).

Prof. T. H. Goodspeed (Berkeley, California) ; Mr. P. J. Greenway (Amani, Tanganyika Territory) ; Mr. A. Grove.

Sir A. Daniel Hall ; Miss F. Hamilton ; Mr. C. G. Hansford (Kampala, Uganda) ; Mr. J. W. Hartley ; Mr. Wm. Hartley (late of Melbourne) ; Mr. J. H. Holland ; Dr. R. E. Holttum (Singapore) ; Dr. D. Hooper ; Mr. A. C. Hoyle.

Mr. A. Bruce Jackson ; Dr. Maria M. Job (La Plata) ; Dr. F. P. Jonker (Utrecht).

Dr. A. F. G. Kerr ; Mr. B. C. Kundu (Bengal).

Dr. I. M. Lamb ; Mr. J. E. Lousley.

Mr. E. M. Mason ; Mrs. Dorothea W. McKay (Johannesburg) ; Mr. S. K. Mukerjee ; Mr. R. S. McKinnon (Br. Somaliland).

Miss E. M. Napier ; Mr. C. Norman.

Mr. M. Ogilvie-Grant ; Mr. W. R. B. Oliver (Wellington, New Zealand) ; Lt.-Col. C. L. Meyler-O'Malley ; Prof. T. G. B. Osborn.

Mr. C. Parkinson (Forest Dept., Burma) ; Dr. Reuben T. Patton (Melbourne) ; Mr. C. Persson (Stockholm) ; Mr. T. Petch ; Dr. W. R. Philipson ; Dr. N. Polunin ; Mr. W. R. Price ; Mr. H. W. Pugsley.

Mr. H. N. Ridley.

Miss K. Sampson ; Mr. J. R. Sealy ; Miss K. M. Sealy ; Mr. J. E. Senaratna (Peradeniya, Ceylon) ; Mr. N. Douglas Simpson ; Dr. H. Sleumer (Berlin) ; Miss L. Snelling ; Miss M. S. Sprague ; Miss Dora B. Stafford ; Mr. W. T. Stearn ; Major F. C. Stern ; Miss W. F. Steven ; Mr. A. L. Still.

Mr. T. Tang (Peiping) ; Dr. Thos. M. C. Taylor (Toronto) ; Dr. Hamilton P. Traub (Washington) ; Mr. A. W. Trethewy ; Mr. R. S. Trickett.

Miss I. C. Verdoorn (Pretoria) ; Miss J. W. Vickery (Sydney).

Mr. T. Wang (Peiping) ; Dr. E. F. Warburg ; Mrs. M. L. Wedgwood ; Miss Dora Weintraub (Johannesburg) ; Dr. Winona H. Welch (Greencastle, Indiana) ; Miss M. M. Whiting ; Miss J. Wilton ; Mr. S. P. Wiltshire ; Mr. W. C. Worsdell.

DISTRIBUTION OF DUPLICATES.

The following were the principal institutions to which duplicates were distributed :—

Great Britain.—London, British Museum (Natural History) ; Manchester, Victoria University ; Oxford, Fielding Herbarium and Imperial Forestry Institute.

Europe, North Africa and Orient.—Algiers, Botanical Laboratory of the University ; Belgrade, Botanic Gardens ; Berlin, Botanic Gardens and Museum ; Bologna, Botanical Institute of the University ; Brussels, Botanic Garden ; Cluj, Botanical Museum ; Coimbra, Botanical Institute of the University ; Geneva, Museum and Botanic Garden ; Helsingfors, Botanical Museum ; Leiden, 's Rijks Herbarium ; Leningrad, Botanical Institute of the Academy of Sciences ; Lisbon, Colonial Garden ; Lund, Botanical Museum ; Paris, Natural History Museum ; Prague, Karlov University ; Sarajevo, State Museum ; Sofia, University ; Stockholm, Natural History Museum ; Uppsala, Botanical Institution ; Utrecht, Botanical Museum and Herbarium ; Vienna, Natural History Museum.

Asia.—Calcutta, Royal Botanic Gardens ; Manila, Bureau of Science ; Peradeniya, Department of Agriculture ; Sapporo, Botanical Institute of the Faculty of Science ; Hokkaido, Imperial University ; Singapore, Botanic Gardens.

Tropical and South Africa.—Amani, East African Agricultural Research Station ; Pretoria, National Herbarium ; Zomba, Forest Department.

America.—Cambridge, Farlow Herbarium and Gray Herbarium ; Iowa, State University ; Jamaica Plain, Arnold Arboretum ; Los Angeles, University of California ; New York, Botanical Garden ; Ottawa, Central Experimental Farm ; San Francisco, California

Academy of Sciences ; Toronto, The University ; Washington, D.C., Bureau of Plant Industry and United States National Museum.

Australia.—Adelaide, The University ; Brisbane, Botanic Museum and Herbarium ; Melbourne, National Herbarium.

Oceania.—Honolulu, Bernice P. Bishop Museum.

The Library

Work on the special tasks mentioned in last year's Report has continued, and satisfactory progress can be recorded.

The first two or three letters of the alphabet of the new Supplement to the Library Catalogue are now ready for printing.

The work of binding arrears, thanks to the renewal of the special grant, was continued during 1938.

PRESENTATIONS TO THE LIBRARY.

Lt.-Colonel Sir David Prain has presented numerous publications and the continuation of various periodicals including : *Bulletin de la Société Botanique de France*, *Berichte der Deutschen Botanischen Gesellschaft*, *The Quarterly Journal of Pharmacy*, and the *Proceedings of the American Philosophical Society*.

Two copies of *Horticultural Colour Chart*, Vol. 1 (1938) have been received from the Royal Horticultural Society ; the Society has also presented copies of *Some good garden plants* by F. J. Chittenden, the *Index to Journal and Proceedings 1838-1935* and *List of Awards, 1859-1935*, and, as in previous years, two copies of their *Lily Year-Book*.

Mr. Ridley has kindly presented to Kew a number of books and pamphlets including : T. Mawe (J. Abercrombie) and others, *Everyman his own gardener*, etc. ed. 4, 1769 ; J. Abercrombie, *The gardener's pocket journal and daily assistant*, etc. ed. 33, 1854 ; E. Beckett, *Vegetables for exhibition and home consumption* ; R. P. Brotherston, *The book of cut flowers* ; J. Fleming, *Spring and winter flower gardening* ; A. Pratt, *Wild flowers* ; T. Rivers, *Rose amateur's guide*.

Mrs. H. B. Morse has presented a number of botanical drawings and papers including *Notes on Formosan plants* by A. Henry and *Chinese Plants* by A. Henry and E. Faber, and also some botanical letters written by Dr. A. Henry to Dr. H. B. Morse, from 1893 to about 1907.

The following books have been kindly given to Kew by Miss R. Burford : Dr. Adam Littleton's *Latine dictionary*, ed. 4, 1703 ; F. Ratzel, *Die Erde und das Leben*, (2 vols.) ; *Sketches of Persia*, etc. ; O. Stapf, *The flora of Mount Kinabalu in North Borneo* ; Wellcome Historical Medical Museum, *Souvenir Cinchona Tercentenary Celebration and Exhibition*.

From the Carnegie Institution of Washington have come *Rainfall and tree growth in the Great Basin* by E. Antevs, *Principles and methods of tree-ring analysis* by S. Glock, A. E. Douglass and

G. A. Pearson, and *Eocene flora of western America* by E. I. Sanborn S. S. Potbury, and H. D. Macginitie.

The Trustees of the British Museum have presented *The British Rhaetic flora*, by T. M. Harris.

Among the publications received during 1938 from the New York Botanical Garden were the continuation of *Addisonia*, *Brittonia*, and the *North American Flora*.

The Crown Agents for the Colonies have sent a copy of E. A. T. Dutton's *The planting of trees and shrubs*.

Volume 7 of the *Flora URSS* has been received from the Botanical Institute of the Academy of Sciences, Leningrad.

The Rhododendron Association has presented its *Year Book* for 1938.

The Bentham-Moxon Trustees have presented a Latin edition (in 11 volumes) of Diodorus Siculus, *Bibliothecae historicae libri qui supersunt e recensione Petri Wesselingii*, etc., Biponti and Argentorati, 1793-1807. This is a valuable acquisition, containing an account of the Hanging Gardens of Babylon built for the royal harem by a Syrian king. *The travels of Ibn Batuta* are now represented by the English translation by the Rev. Samuel Lee, published in 1829, which contains notes on the botany. Another noteworthy addition to the Library is V. Cordus, *Dispensatorium*, etc. Lugduni Bataviae, 1618. Other works presented by the Trustees are :—T. Montsainct, *Le jardin senonois*, etc. Sens, 1604 ; P. J. B. Chomel, *Catalogue des plantes d'usage suivant l'ordre de leur vertus* [s.l. et a] ; J. B. Triumfetti, *Syllabus plantarum horto medico Romanae sapientiae . . . anno 1688 additarum*, Romae, 1688 ; C. Donarelli, *Enumeratio seminum*, etc., Romae, [s.a.] ; the Bentham-Moxon Trustees have also presented the continuation of several periodicals in exchange for Hooker's *Icones Plantarum*.

The Editor of "Nature" has presented the following :—R. S. Adamson, *Vegetation of South Africa* ; A. H. G. Alston, *The Kandy flora* ; F. J. Chittenden (Ed.), *Ornamental flowering trees and shrubs : report of the Conference held by the Royal Horticultural Society, 1938* ; C. Flahault, *La distribution géographique des végétaux dans la région méditerranéenne française* ; P. J. Greenway, *A Swahili dictionary of plant names* ; Hsen-Hsu Hu and Woon-Young Chun, *Icones plantarum sinicarum*, fasc. 5 ; A. F. G. Kerr (Ed.), *Florae siamensis enumeratio*, vol. 2, part 4, *Vacciniaceae to Styraceae* ; J. H. McFarland, R. M. Hatton and D. J. Foley, *Garden bulbs in color* ; Oxford University Exploration Club, *British Guiana papers : scientific results of the Oxford University Expedition to British Guiana in 1929* ; L. and M. Pardé, *Arbres et forêts* ; J. O. Thomas and L. J. Davies, *Common British grasses and legumes* ; J. E. Weaver and F. C. Clements, *Plant ecology*, ed. 2.

The following publishers have sent the books mentioned for review in the Bulletin :—Anglo-Scottish Press : W. F. Bewley and J. Harnett, *The cultivation of mushrooms*, ed. 2 ; Baillière, Tindall

and Cox: S. A. Waksman, *Humus: origin, chemical composition, and importance in nature*; British Empire Vegetation Committee: R. S. Adamson, *Vegetation of South Africa*; Cambridge University Press: A. Arber, *Herbals: their origin and evolution*; Chapman and Hall: L. Bonar, L. Roush and R. M. Holman, *A laboratory guide for a course in general botany*, ed. 4; R. M. Holman and W. W. Robbins, *Textbook of general botany*, ed. 4; W. Seifriz, *The physiology of plants*; Department of Agriculture and Stock, Brisbane, Queensland: C. T. White, *Principles of botany for Queensland farmers*; Imperial Forestry Institute, University of Oxford: G. S. Cansdale, *The black poplars and their hybrids cultivated in Britain*; Journal of Park Administration, Ltd.: W. W. Pettigrew, *Municipal parks: layout, management and administration*; Longmans, Green and Co.: J. H. Priestley and L. I. Scott, *An introduction to botany*; Macmillan and Co.: F. O. Bower, *Sixty years of botany in Britain (1875-1935)*; Marshall Press: E. Richardson, *The bog-garden: its construction and maintenance*; N. V. A. Oosthoek's Uitgevers Mij., Utrecht: A. A. Pulle, *Compendium van de terminologie, nomenclatuur en systematiek der zaadplanten*; Oxford University Press: S. C. Atchley, *Wild flowers of Attica*; Lord Hailey, *An African survey*; E. B. Worthington, *Science in Africa*; Putnam and Co.: T. Hay, *Plants for the connoisseur*; F. Stoker, *A gardener's progress*; Reinhold Publishing Corporation: C. Ellis and M. W. Swaney, *Soilless growth of plants*; C. Scribner's Sons: D. Fairchild, *The world was my garden*.

Among the more important works received, presented by the authors unless otherwise stated, are the following:—A. H. G. Alston, *The Kandy flora* (from Director of Agriculture, Peradeniya, Ceylon); Oakes Ames, *Resupination as a diagnostic character in the Orchidaceae, with special reference to Malaxis monophyllos*; M. Aubréville, *Report of the Niger Colony Forestry Expedition*, Sept.-Dec., 1935 (from the Imperial Forestry Institute, Oxford); Australian and New Zealand Association for the Advancement of Science, *Report of the 23rd Meeting, 1937*; C. Baehni, *Mémoires sur les Sapotacées*, 1: *système de classification*; F. M. Bain, *Bronze leaf wilt disease of the coconut palm*; R. C. Bakhuizen van den Brink, *Revisio Ebenacearum malayensium*, pp. 177-368 (from the Curator, Botanic Garden, Buitenzorg); M. Barros, *Ciperáceas Argentinas*, 2 and 3; A. W. Bayer, *An account of the plant ecology of the coastbelt and midlands of Zululand*; C. M. Beadnell, *Dictionary of scientific terms* (from Mr. C. E. C. Fischer); G. Beauverd and S. Topali, *Contribution à la connaissance de la flore hellénique*, 1 and 2 (from G. Beauverd); C. Beddington, *Shrubs and plants at the Villa Yolanda, Ospedaletti* (2 copies); G. Benl, *Die genetischen Grundlagen der Blütenfarben (Sammelreferat)*; F. Boergesen, *Contributions to a South Indian marine algal flora*, 2 and 3; F. Boeuf, *Le blé en Tunisie*, vols. 1 and 2; H. M. L. Bolus, *Notes on Mesembryanthemum and allied genera*, part 3, March 1938 (3 copies); G. Bondar, *A*

cultura de cacao na Bahia ; S. Boothman, *The alpine house and its plants* ; N. S. Borkhsenius, *Coccidae of quarantine value for U.S.S.R. and their allied species* (from Commissariat of Agriculture, Quarantine Inspection, Georgia) ; C. E. B. Bremekamp, *The Malaysian species of the genus Ixora* (Rub.) ; British Association for the Advancement of Science, *Report 1937* (from Miss E. M. Wakefield) ; J. C. Brunet, *Manuel du libraire et de l'amateur de livres*, ed. 3, tomes 1-4 (from Miss M. S. Sprague) ; *Bulletin de la Station de Recherches Forestières du Nord de l'Afrique*, vol. 1, 1917 (from Directeur, Station de Recherches Forestières du Nord de l'Afrique) ; A. L. Cabrera, *Revision del genero "Chaetanthera"* (Compositae) ; Cambridge, *International Council of Scientific Unions, Reports of Proceedings 1937* ; O. Campese, *Coltura tropicali e lavorazione dei prodotti*. vol. 1, *Generalita* (from Ulrico Hoepli (Ed.)) ; R. C. Ching, *Icones Filicum sinicarum*, fasc. 3 ; M. A. Coppey, *Mousses nouvelles de l'Indo-Chine et du Yunnan* (from Mr. F. Ballard) ; B. H. Danser, *The Loranthaceae of French Indo-China and Siam* (3 copies) (from D. F. van Slooten) ; B. H. Danser, (1) *A revision of the genus Korthalsella* ; (2) *The Loranthaceae Lorantheidae of the tropical archipelagos east of the Philippines, New Guinea, and Australia* ; H. C. Darby (Ed.), *A scientific survey of the Cambridge district* (from Dr. W. B. Turrill) ; O. Degener, *Flora hawaiiensis*, book 2 ; R. W. G. Dennis and D. G. O'Brien, *Boron in Agriculture* (from Director, Boron Agric. Bureau) ; J. De Toni, *Diagnoses algarum novarum post sylloges editionem descriptarum*, 1: *Myxophyceae* (from dott. G. De Toni) ; Deutsche Rhododendron-Gesellschaft, *Rhododendron und immergrüne Laubgehölze* ; E. De Wildeman, *Dioscorea alimentaires et toxiques (morphologie et biologie). Espèces et variétés Congolaises* (2 copies) ; R. A. Dyer, *The vegetation of the divisions of Albany and Bathurst* ; Empire Forestry Association, *Empire Forestry Handbook 1938* ; C. Epling, *The Californian salvias: a review of Salvia, section Audubertia* ; A. Ernst, *Stammesgeschichtliche Untersuchungen zum Heterostylieproblem* ; W. Ferguson, (1) *Gramineae or grasses indigenous to or growing in Ceylon, etc.* ; (2) *The vascular cryptogams of Ceylon, etc.* (from Mr. J. E. Senaratna) ; Forest Service, U.S. Dep. Agric., *Range plant handbook* (2 copies) ; F. E. Fritsch and others, *Contributions to our knowledge of the freshwater algae of Africa*, Nos. 2, 6, 11, 12 and 13 (from Prof. F. E. Fritsch) ; T. Gaarder and E. Alvsaker, *Humusen i udyrket Vestlandsfjord* (from Vestlandets forstlige Forsøksstasjon, Bergen, Norway) ; A. T. Gage, *A history of the Linnean Society of London* (from the Linnean Society) ; C. A. Gardner and others, (1) *Poison plants of south-western Australia* ; (2) *West Australian wildflowers* (from Mr. P. Stanway-Tapp) ; F. C. Gates, *Grasses in Kansas* (from the Secretary, State Board of Agric., Kansas) ; A. Guillaumin, (1) *Plantes grasses* ; (2) *Plantes utiles*, (*Guide aux collections de plantes vivantes du Muséum National d'Histoire Naturelle*, 4) ; A. Guillaumin et R. Franquet, *Arbres et*

arbrisseaux utiles ou ornementaux (*Guides aux collections de plantes vivantes du Muséum National d'Histoire Naturelle*, 3) (from Muséum National d'Histoire Naturelle, Paris); I. Haeckel and W. Troll, *Botanische Ergebnisse der deutschen Hindukusch-Expedition*, 1935 (from Dr. I. Haeckel); G. B. E. Hasselberg, *Zur Morphologie des vegetativen Sprosses der Loganiaceen*; Sir A. Hort, *The "Critica Botanica" of Linnaeus*. Translation. (Revised by Miss M. L. Green with introduction by Sir A. W. Hill) (from Lady Hort); M. M. Iljin, *Flora Turkmenii*, tom 2, no. 1; International Grassland Congress, *Report of the Fourth International Grassland Congress*, 1937; H. Jacobsen, *Verzeichnis der Arten der Gattung Mesembryanthemum L.*; F. P. Jonker, *A monograph of the Burmanniaceae*; J. Jundzitt, *Opisanie Roślin*, etc. 1830 (from Dr. T. Wisniewski); U. N. and P. C. Kanjilal and A. Das, *Flora of Assam*, vol. 2 (from the Conservator of Forests, Assam); K. Kluk, (1) *Dykcyonary Roślinny*, etc. 1805–46, 3 vols.; (2) *O Roślinach, ich utrzymaniu, rozmnożeniu i zazywaniu*, 2 vols., 1778 and 1797 (from Dr. T. Wisniewski); A. A. Kolakovskii, *Flora Abkhazii*, tom 1 (from the Institute of Culture, Academy of Sciences, Abkhasia); A. J. G. H. Kostermans, *Revision of the Lauraceae*, 3, 4 and 5; Y. Kudo, *Hand-list of exotic orchids in Taiwan* (from Dep. of Forestry, Gov. Res. Inst., Taihoku, Taiwan); E. Latzina, *Index de la flora dendrologica argentina*; R. McVaugh, *Studies in the taxonomy and distribution of the eastern North American species of Lobelia* (from the University of Pennsylvania); R. Maire, *Contributions à l'étude de la flore de l'Afrique du Nord*, fasc. 21–26; S. F. Markham, *The museums and art galleries of the British Isles* (2 copies) (from Carnegie United Kingdom Trust); J. W. Mathews, *Cultivation of non-succulent South African plants* (from the Botanical Society of South Africa); S. Mangham and A. R. Hockley, *Biology for pharmaceutical students and others* (from Prof. S. Mangham); E. D. Merrill and E. H. Walker, *A bibliography of eastern Asiatic botany* (from Dr. E. D. Merrill); P. Mouterde, *Petite flore des environs de Beyrouth*; R. M. Nattrass, *A first list of Cyprus fungi*; G. Nygaard, *Contributions to our knowledge of the freshwater algae of Africa*, no. 9 (from Miss E. L. Stephens); A. A. Obermeijer, *The South African species of Blepharis*; Oxford University Exploration Club, *British Guiana papers. Scientific results of the Oxford University Expedition to British Guiana in 1929*; L. R. Parodi, *Contribucion al estudio de las Gramineas del género "Paspalum" de la flora uruguaya*; L. Pomini, *Le piante officinali e del Sottobosco spontanee o coltivate della provincia di Vercelli*; O. Posthumus, *Malayan fern studies*, 1: *The synonymy and distribution of the Java ferns*; Reading University Faculty of Agriculture and Horticulture, *Papers read at the third revision course in horticulture*, 1937 (from Prof. R. H. Stoughton); P. K. Reynolds, *The banana* (from Mr. H. Holt); Royal Asiatic Society of Bengal, *Proceedings of the 25th Indian Science Congress, Calcutta*, 1938, part 2, *Presidential Addresses*; G. Sampaio, 34 botanical

papers on the flora of Portugal (from the Director, Instituto de Botanica, Faculdade de Ciencias da Universidade, Porto, Portugal); G. Sampaio, *Lista das espécies representadas no Herbário Português*, and Appendixes 1–3 (from Prof. Dr. Americo Pires de Lima); S. Sasaki: *Phytogeographical and floristic studies on the islands series of Kotosyo*, part 1: *Enumeration of hitherto known indigenous pteridophytes and their geographical distribution* (from Dep. of Forestry, Gov. Res. Inst., Taihoku); E. E. Sherff, *Revision of the Hawaiian species of Euphorbia L.*; C. Skottsberg, *Die Flora der Desventuradas-Inseln (San Felix und San Ambrosio)*; G. D. Srivastava, *Flora of Allahabad*; W. T. Stearn, (1) *Epimedium and Vancouveria (Berberidaceae), a monograph* (2 copies); (2) *Index to genera and families in Presl, Reliquiae Haenkeanae*, vol. 2; Th. Streiffert: *The forests of Sweden* (from the Consul General for Sweden); R. Sudell, *Herbaceous borders and the waterside* (from the Univ. of London Press); C. F. Symington, *Notes on Malayan Dipterocarpaceae*, 1 and 4; M. Szubert, *Spis Roślin Ogródu Botanicznego Krolewskiego-Warszawskiego Uniwersytetu*, 1824 (from Dr. T. Wisniewski); Texas Agricultural Experiment Station, *Catalogue of the flora of Texas* (Bulletin 550); *Valuable plants native to Texas* (Bulletin 551); I. Tollan, *Skoggrenser på Nordmøre*; R. P. True, *Gall development on Pinus sylvestris attacked by the Woodgate Peridermium, and morphology of the parasite* (from the University of Pennsylvania); W. B. Turrill, *The expansion of taxonomy with special reference to Spermatophyta*; Union-Castle Mail Steamship Co. Ltd., *The South and East African Year-book and Guide for 1939*; R. E. Vaughan and P. O. Wiehe, *Studies on the vegetation of Mauritius*, 1: *a preliminary survey of the plant communities*; R. E. Wean, *The parasitism of Polyporus Schweinitzii on seedling Pinus strobus* (from the University of Pennsylvania); W. J. Zimmer, *The flora of the far north-west of Victoria* (from the Forests Commission of Victoria).

The following periodicals, additional to those mentioned in recent reviews, have been received. These have been presented by the editors, societies or institutions issuing them unless otherwise stated:—*Annales de l'École Nationale d'Agriculture de Grignon*, sér. 2, 1; *Archivos do Instituto de Pesquisas Agronomicas, Pernambuco*, no. 1; *Bulletins of Batum Subtropical Botanical Garden*, no. 1; *Bulletin of the Georgian Experiment Station of Plant Protection*. Ser. A. *Phytopathology*, no. 1; *Bulletins of the Introduction Garden of Subtropical Cultures, Sukhumi*, nos. 1–9; *Calcutta University, Journal of the Department of Science*, vol. 1, no. 1 (New Series); *Contribuciones a la Historia Natural Colombiana*, nos. 1 and 2; *Current Monthly Record of Forest Literature, Imperial Forestry Institute, Oxford*, nos. 1–31; *Jornal de Agronomia*, vol. 1, nos. 1–4; *Journal of the John Innes Association*, nos. 3 and 4; *Journal of the Society for the Bibliography of Natural History*, vol. 1, nos. 1–4 (from Miss M. L. Green); *Research Bulletins, Saito Ho-on Kai Museum*

(*Botany*), nos. 1-5 ; *Soils and Fertilizers*, vol. 1, nos. 1-6 ; *Species Lupinorum*, signatures 1 and 2 ; *Travaux de l'Institut Botanique, Bacou*, tomes 1 and 2.

As in former years publications have been received from the Empire Cotton Growing Corporation, the Imperial Agricultural Bureaux, and from Departments of Botany, Agriculture and Forestry at home, in the overseas Empire, and in foreign countries.

We are again indebted to numerous authors of botanical papers who have kindly sent reprints.

The Ordnance Survey Office, Southampton, have presented further maps of the fifth (relief) edition, and additional maps have also been presented by the War Office. Other maps received include five compiled by the National Geographical Society presented by Miss Fischer ; an administrative map of U.S.S.R. from the Society for Cultural Relations with Foreign Countries ; one of Sarawak from the Royal Geographical Society ; one of the Isle of Wight from Mr. H. K. Airy-Shaw ; three maps of parts of Brazil from Mr. H. N. Ridley ; one of Matonchi Farm, Mwinilunga, compiled and presented by Mr. E. Milne-Redhead ; and a map of Kimberley District from Miss Wilman.

ROYAL BOTANIC GARDENS, KEW

LIST OF STAFFS

31ST DECEMBER, 1938

Head Office

- DIRECTOR—Sir A. W. Hill, K.C.M.G., M.A., Sc.D., D.Sc. (Adelaide),
F.R.S., F.L.S., V.M.H.
ASSISTANT DIRECTOR—J. S. L. Gilmour, M.A., F.L.S.,
ECONOMIC BOTANIST—Sir Geoffrey Evans, C.I.E., M.A., Dip. Agric.
ASSISTANT BOTANIST—B. L. Burtt, B.Sc.
CLERK (HIGHER GRADE)—S. F. Ormsby.

Herbarium and Library

- KEEPER—A. D. Cotton, O.B.E., F.L.S.
DEPUTY KEEPER—T. A. Sprague, D.Sc., F.L.S.
BOTANISTS—Miss E. M. Wakefield, M.A., F.L.S.
W. B. Turrill, D.Sc., F.L.S.
C. V. B. Marquand, M.A., F.L.S.
V. S. Summerhayes, B.Sc.
Miss M. L. Green, B.A., F.L.S.
F. Ballard, B.Sc.
N. Y. Sandwith, M.A., F.L.S.
C. E. Hubbard, F.L.S.
E. W. B. H. Milne-Redhead, M.A.
H. K. Airy-Shaw, B.A., F.L.S.
-

- C. E. C. Fischer (*India*).
D. G. Collett, B.Sc. (*South Africa*).
C. A. Gardner (*Western Australia*).

- ASSISTANT BOTANISTS—E. Nelmes (*Library*).
Miss C. I. Dickinson, M.A., Dip. Agric.
A. A. Bullock, B.Sc.
TEMPORARY BOTANIST—E. G. S. Brown, B.Sc., Ph.D.
ARTIST—G. Atkinson.
HON. ASSOCIATE (*Transplant and Breeding Experiments*)—E. M. Marsden-Jones, F.L.S.

Jodrell Laboratory

- ASSISTANT KEEPER—C. R. Metcalfe, M.A., Ph.D.

Museums

- KEEPER—J. Hutchinson, LL.D., F.L.S.
ASSISTANTS—F. N. Howes, D.Sc.
R. Melville, B.Sc., Ph.D., F.L.S.

Gardens

- CURATOR—W. M. Campbell, N.D.H.
ASSISTANT CURATORS—A. Osborn (*Arboretum*).
C. P. Raffill, A.H.R.H.S. (*Temperate*).
L. Stenning (*Tropical*).
S. A. Pearce (*Greenhouse and Ornamental*).
G. H. Preston (*Herbaceous*).
CLERK (HIGHER GRADE)—A. Hearn.

INDEX

A.

- Abies Douglasii* Lindl., 80.
 — *excelsa* var. *brevifolia* Cripps ex Gordon, 85.
 — *mucronata* Rafin., 80.
 — *taxifolia* Poir., 80.
Abrus mollis Hance, 276.
Abutilon graveolens var. *hirtum* Mast., 221.
Acacia Farnesiana Willd., 279.
Acanthospermum hispidum DC., 366.
Acaulon N. E. Br., 156.
 — *rosulatum* N. E. Br., 158.
Achimenes brevifolia Morton, 292.
 — *dulcis* Morton, 293.
 — *flava* var. *puberula* Morton, 293.
 — *fimbriata* Rose, 293.
Achyranthes indica Linn., 374.
Acnistus arborescens Schlecht., 370.
Acrostichum aureum Linn., 383.
 Adams, F. Presentation of Miss Mainland's index to localities of diatoms, 400.
 Additions to the flora of Borneo and other Malay islands, 110, 173, 175, 221, 275.
Adenia acuminata Koorders, 112.
 — *borneensis* H. Hallier, 112.
 — *Clementis* Merrill, 112.
 — *cordifolia* Engl., 112.
 — *populifolia* H. Hallier, 112.
 — *smilacina* H. Hallier, 112.
Adinandra cordifolia Ridley, 173.
Aegiphila perplexa Moldenke, 373.
Aeschynomene indica Linn., 277.
 Afghanistan, a new species of Delphinium from, 86.
 African orchids, 141.
 — Rubi in the Kew herbarium, notes on, 177.
 Aglaia, two new names in, 215.
Aglaia triandra Ridley, 215.
 — *trimera* Ridley, 215.
 — *triplex* Ridley, 215.
 — *unifoliolata* Ridley, 215.
Agrostis gigantea Roth, 90.
 — *tenuis* Sibth., 90.
Aira alpina Linn., 90.
 Airy-Shaw, H. K. Contributions to the flora of Borneo, 306.
 — The correct name of the common parsley, 256.
Aistocaulon Poelln., 156.
 — *rosulatum* Poelln., 158.
 Akhtar, S. A. A new species of Delphinium from Afghanistan, 86.
Albizzia stipulata Benth., 279.
Alchemilla australiana Rothm., 270.
 — *Berteroana* Briq., 269.
 — *cashmeriana* Rothm., 273.
 — *chthamalea* Rothm., 274.
 — *frigida* Wedd., 271.
 — *galioides* Benth., 271.
 — *galioides* Treviranus, 271.
 — *Hultenii* Rothm., 272.
 — *Perryana* Rothm., 271.
 — *pseudovenusta* Rothm., 271.
 — *Trollii* Rothm., 272.
 — *ypsilotoma* Rothm., 273.
Alcmene tobagensis Urb., 355.
Alibertia tobagensis Sprague et Williams, 364.
Aloinopsis Schwantes, 155.
 — *aloides* Schwantes, 158.
 — *albinota* Schwantes, 159.
 — *albipuncta* Schwantes, 159.
 — *Broomii* L. Bolus, 160.
 — *cibdela* Schwantes, 159.
 — *Dyeri* L. Bolus, 159.
 — *Gerstneri* L. Bolus, 160.
 — *Jamesii* L. Bolus, 160.
 — *Lodewykii* L. Bolus, 160.
 — *Loganii* L. Bolus, 160.
 — *pallens* L. Bolus, 160.
 — *Peersii* L. Bolus, 160.
 — *rosulata* Schwantes, 158.
 — *rubrolineata* Schwantes, 159.
 — *Schoonesii* L. Bolus, 160.
 — *transvaalensis* Schwantes, 158.
 — *vittata* Schwantes, 158.
 — *Wilmaniae* L. Bolus, 160.
 Alpine house, the (review), 311.
Alseodaphne dumicola W. W. Smith, 212.
 Alston, A. H. G. Notes on the flora of Tobago: Pteridophyta, 383.
Alternanthera ficoidea R. Br., 374.
Alyssum fulvescens Sibth. et Sm., 464.
Amaranthus dubius Mart., 373.
 America, contributions to the flora of tropical, 59, 163, 292, 353.
Amorphophallus commutatus Engl., 37.
Amphilophium paniculatum H. B. K., 372.
 Anatomy of *Fraxinus oxycarpa* and *F. Pallisae*, 258.
Aneimia hirsuta Sw., 384.

Anemopaegma carrerense Armitage, 372.
 — *tobagense* Urb., 372.
Anguria umbrosa H. B. K., 362.
Antennaria compacta Malte, 90.
 Ants of the Royal Botanic Gardens, Kew, the, 390.
Apeiba Schomburgkii Szyszyl., 357.
 — *Tibourbou* var. *membranacea* Lockh., 357.
Aphanes andicola Rothm., 269.
 — *australiana* Rothm., 270.
 — *Berteroana* Rothm., 269.
 — — forma *vegeta* Rothm., 269.
 — *pentamera* Rothm., 270.
Aphelandra lineariloba Leonard, 63.
 — *tetragona* Nees, 372.
 — *verticillata* Nees, 64.
Apium crispum Mill., 257.
 — *latifolium* Mill., 258.
 — *Petroselinum* Linn., 257.
 — — var. *angustifolium* Hayne, 257.
 — — — var. *crispifolium* Hayne, 257.
 — — — var. *crispum* Willm., 257.
 — — — var. *vulgare* Nois., 257.
 Appointments—
 Corkhill, W. J., 133.
 Evans, G., 350.
 Faulkner, O. T., 396.
 Gibbins, C. B., 397.
 Jones, G. A., 397.
 Prescott, J. A., 214.
 Richardson, A. E. V., 214.
 Robbie, J., 133.
 Robbins, W. J., 52.
Araeococcus micranthus Brongn., 379.
 Arber, A. Herbs (review), 307.
 Argentina, two new species of *Senecio* from, 197.
Arundinaria Walkeriana Munro, 126.
 Artist's herbal, an (review), 172.
 Asiatic botany, a bibliography of Eastern, 310.
Aspilia verbesinoides Blake, 366.
 Assam, a flora of (review), 312.
 —, a new *Eugenia* from, 262.
 —, plants new to, 210.
Aster Gouldii C. E. C. Fischer, 286.
 Australian agricultural appointments, 214.
Avicennia alba Blume, 443.
 — *officinalis* Linn., 443, 444.
 — — var. *alba* C. B. Clarke, 444.
 — *marina* var. *alba* Bakh., 444.
 — *sphaerocarpa* Stapf ex Ridley, 443, 444.
 — *tomentosa* Roxb., 444.

Axonopus amplifolius Chase, 382.
 — *compressus* Beauv., 382.

B.

Bailey, J. F. (obit.), 350.
 Baker, J. R. Rain-forest in Ceylon, 9.
 Ballard, F. Herbarium specimens and gas-poisoning, 397.
Ballota suaveolens Linn., 192.
Balsamina capensis DC., 162.
Banisteria apiculata C. B. Rob., 357.
Baphia micrantha Ridley, 280.
 Barnes, E. Flowering plants of Madras city and its immediate neighbourhood, supplement (review), 400.
Barringtonia anacardiifolia Ridley, 284.
 — *Havilandii* Ridley, 284.
Basanacantha phyllosepala Sprague et Williams, 364.
 Bausch, J. A revision of the Eucryphiaceae, 317.
Beaumontia brevituba Oliv., 295.
Begonia humilis Ait., 362.
Becquerelia cymosa Brongn., 381.
 Bell, C. F., 52.
Beloperone longibracteata Leonard, 72.
Berginia Hintonii Leonard, 64.
Besleria Seitzii Krug et Urb., 371.
 Bewley, W. F., and Harnett, J. The cultivation of mushrooms (review), 316.
 Bibliography of Eastern Asiatic botany (review), 310.
 Binghamia, *Haageocereus* and *Pseudoëspostoa*, 456.
Binghamia Britt. et Rose, 457.
 — *acrantha* Britt. et Rose, 457.
 — *melanostele* Britt. et Rose, 457, 458.
 — *pseudomelanostele* Bullock, 457.
Biophytum intermedium Wright, 32.
 — — var. *pulneyense* Edgew. et Hook. fil., 32.
 Birthday honours, 265.
 Biswas, K. A new *Eugenia* from Assam, 262.
 Black poplars, the (review), 313.
Blechnum lanceola Sw., 383.
Boehmeria ramiflora Jacq., 377.
Boerhaavia caribaea Jacq., 373.
 Bolus herbarium, new building at the University of Cape Town for the, 470.

- Bonar, L., Roush, L., and Holman, R. M. A laboratory guide for a course in general botany (review), 316.
- Books—
- Alpine house, the, 311.
 - Artist's herbal, an, 172.
 - Bibliography of Eastern Asiatic botany, 310.
 - Black poplars, the, 313.
 - Botanical magazine, 86, 265, 311, 399.
 - Cacti, 169.
 - Chronica botanica, 265.
 - Compendium van de Terminologie, &c., 308.
 - Critica botanica, 217.
 - Cultivation of mushrooms, the, 316.
 - Ecology in town and classroom, 172.
 - Flora of Assam, a, 312.
 - Flowering plants of Madras city and its immediate neighbourhood; supplement, 400.
 - Forest bibliography, 88.
 - Gardener's progress, a, 351.
 - Hardy bulbs, 170.
 - Herbals, 307.
 - How to grow roses, 136.
 - Laboratory guide for a course in general botany, a, 316.
 - Lily year-book, the, 171.
 - Plants for the connoisseur, 314.
 - Present day rock garden, the, 134.
 - Sixty years of botany in Britain (1875-1935), 215.
 - Soilless growth of plants, 314.
 - Swahili dictionary of plant names, a, 87.
 - Textbook of general botany, a, 351.
- Boothman, S. The alpine house (review), 311.
- Borg, J. Cacti (review), 169.
- Borneo and other Malay islands, additions to the flora of, 110, 173, 175, 221, 275.
- , contributions to the flora of, 306.
- Borreria eryngioides* Cham. et Schlecht., 365.
- *ocymoides* DC., 365.
- Borzacactus* Riccobono, 455.
- Botanical congress, Stockholm, seventh international, 400.
- gardens of the University of British Columbia, 471.
- magazine (review), 86, 265, 311, 399.
- monkeys, 306.
- name of the Douglas fir, the, 79.
- Bothriochloa intermedia* var. *acidula* C. E. Hubbard, 383.
- Botrychium matricarioides* A. Br., 90.
- Boulenger, G. A. (obit.), 84.
- Bower, F. O. Sixty years of botany in Britain (1875-1935) (review), 215.
- Bracher, R. Ecology in town and classroom (review), 172.
- Brangham, A. N. The ants of the Royal Botanic Gardens, Kew, 390.
- Brasil, four new species of Vernoniaeae collected by Glaziou in, 298.
- Bridgesia and Chileniopsis, 300.
- Bridgesia* Backeb., 300.
- British Columbia, botanical gardens of the university, 471.
- Brownea latifolia* Jacq., 359.
- Brownlowia elliptica* Ridley, 227.
- *glabrata* Stapf ex Ridley, 226.
- *Riedelii* Hemsl., 227.
- *riparia* Ridley, 226.
- Brotera* Spreng., 189.
- *persica* Spreng., 192.
- Bruce, E. A., and Bullock, A. A. On the synonymy and distribution of *Strychnos innocua* Del., 45.
- Bryce, G., 265.
- Buceragenia hirsuta* Leonard, 71.
- Buettneria scabra* Ridley, 225.
- Bulbs, hardy (review), 170.
- Bullock, A. A. Binghamia, Haageocereus and Pseudoëspostoa, 454.
- Chileniopsis and Bridgesia, 300.
- Further notes on the genus *Bursera*, 163.
- Lectotypes of *Nananthus* and *Aloinopsis*, 153.
- Neoporteria and Chilenia, 296.
- *Pedilanthus* versus *Tithymalus*, 468.
- , and Bruce, E. A. On the synonymy and distribution of *Strychnos innocua* Del., 45.
- , and Marquand, C. V. B. *Callicarpa subpubescens* Hook. et Arn., 399.
- , and Sprague, T. A. *Penstemon campanulatus* and *P. Kunthii*, 1.
- Burma, contributions to the flora of, 294.
- Bursera*, further notes on the genus, 163.
- Bursera bicolor* Engl., 163.
- *bipinnata* Engl., 164.
- *coyucensis* Bullock, 164.
- *diversifolia* Rose, 164.

- Bursera dubia* Bullock, 165.
 — *elemifera* Baill., 164.
 — *excelsa* Engl., 165.
 — *fragrantissima* Bullock, 165.
 — *glabrifolia* Engl., 164.
 — *grandifolia* Engl., 165.
 — — var. *robusta* Bullock, 166.
 — *heteresthes* Bullock, 166.
 — *Hintoni* Bullock, 166.
 — *laxiflora* S. Wats., 166.
 — *longipes* Standl., 166.
 — *ovalifolia* Engl., 167.
 — *penicillata* Engl., 167.
 — *sessiliflora* var. *pubivalvis* Bullock, 167.
 — *Simaruba* Sarg., 358.
 — *Tecomaca* Standl., 168.
 — *trimera* Bullock, 168.
 — *velutina* Bullock, 168.
 Burt, B. D. (obit.), 301.
 Burt, B. L. Meerburgh's *Impatiens capensis*, 161.
 — The taxonomic position of *Tetrathalamus*, 458.

C.

- Cabrera, A. L. Two new species of *Senecio* from Argentina, 197.
 Cacti (review), 169.
Cactus Humboldtii H. B. K., 456.
 — *isogona* H. B. K., 456.
 — *villosus* Monville, 301.
Calanthe biloba Lindl., 213.
Callicarpa angustifolia King et Gamble, 412, 413.
 — *arborea* Roxb., 411, 412.
 — — var. *villosa* King et Gamble 411, 413.
 — *cana* Linn., 412, 413.
 — — var. *typica* Bakh., 413.
 — *cuspidata* Roxb., 414, 415.
 — *glandulosa* Fletcher, 199, 412, 414.
 — *lanata* Linn., 412, 413.
 — *longifolia* Lam., 412, 414.
 — — var. *lanceolaria* C. B. Clarke, 412, 414.
 — — var. *subglabrata* Schauer, 414.
 — *macrophylla* Vahl, 412, 414.
 — *Maingayi* King et Gamble, 411, 413.
 — *Poilanei* Dop, 412, 413.
 — *psilocalyx* C. B. Clarke, 412, 415.
 — *rubella* Lindl., 412, 414.
 — *subpubescens* Hook. et Arn., 399.
 — *tomentosa* Linn., 412.
 — — var. *lanata* Bakh., 413.
 — — var. *typica* Bakh., 413.

- Callicarpa villosa* Roxb., 413.
 — *villosissima* Ridley, 412.
Calophyllum Benjaminia Ridley, 119.
 — *cuspidatum* Ridley, 119.
 — *elegans* Ridley, 118.
 — *fragrans* Ridley, 120.
 — *frutescens* Ridley, 121.
 — *glaucescens* Ridley, 120.
 — *globuliferum* Ridley, 121.
 — *Hosei* Ridley, 120.
 — *Molleyi* Ridley, 122.
 — *palustre* Ridley, 121.
 — *pustulatum* Ridley, 118.
Calyptanthus sericea Griseb., 360.
 — sp. ?, 360.
Calyptrocarya glomerulata Urb., 382.
 — *intermedia* C. B. Clarke, 382.
Canavalia rosea DC., 276.
 — *turgida* Grah., 277.
 Cansdale, A. S., and others. The black poplars (review), 313.
Capparis flexuosa Linn., 355.
Carallia confinis var. *pauciflora* Bl., 282.
 — *coriifolia* Ridley, 283.
 — *cuprea* Ridley, 282.
 — *viridiflora* Ridley, 282.
Carapa borneensis Becc., 290.
 — *carnosula* Zoll. et Mor., 288.
 — *indica* Juss., 291.
 — *moluccensis* Lam., 288.
 — *obovata* Bl., 288.
 — *procera* DC., 292.
Carex, notes in, 106, 242.
Carex aethiopica var. *stolonifera* Boeck., 247.
 — *cuprea* Nelves, 247.
 — *cyrtosaccus* C. B. Clarke, 244.
 — *elgonensis* Nelves, 245.
 — *exploratorum* Nelves, 108.
 — *Graeffeana* Boeck., 109.
 — — var. *samoënsis* Nelves, 110.
 — *Greenwayi* Nelves, 244.
 — *illegitima* Cesati, 468.
 — *longipedunculata* subsp. *cuprea* Kükenth., 247.
 — *Mackenziei* Krecz, 90.
 — *magellanica* Lam., 90.
 — *norvegica* Willd. ex Schk., 90.
 — *philippinensis* Nelves, 109.
 — *Preussii* K. Schum., 246.
 — — var. *camerunensis* Nelves, 247.
 — *simensis* var. *stolonifera* Kükenth., 247.
 — *Thomasii* Nelves, 245.
 — *vallis-rosetto* K. Schum., 243.
Careya lanceolata Ridley, 285.

Carlowrightia coyucana Leonard, 67.
 — *lanceolata* Leonard, 66.
 — *mucronata* Leonard, 66.
Carludovica coronata Gleason, 380.
 — *insularis* Gleason, 380.
Carpodontos Labill., 318.
 — *lucidus* Labill., 326.
Carum Petroselinum Benth., 257.
 — — var. *crispum* Beck, 258.
 — — var. *typicum* Beck, 258.
Caryopteris paniculata C. B. Clarke, 437.
Casearia Moultonii Ridley, 111.
 — *spinescens* Griseb., 355.
 — *Stapfiana* Ridley, 110.
 — *sylvestris* Sw., 355.
Cassia bacillaris Linn. fil., 359.
 — *patellaria* DC., 359.
Castanola insignis Schellenb., 275.
Castanopsis purpurea Barnett, 105.
Catasetum macrocarpum Rich., 377.
Catopsis sessiliflora Mez, 379.
Cayaponia racemosa Cogn., 362.
 Cell theory, the centenary of the, 472.
 Centenary of the cell theory, the, 472.
Cephaelis muscosa Sw., 365.
Cephalocereus melanostele Vaupel, 458.
Ceratanthus calcaratus G. Taylor, 296.
Ceratophyllum tobagense Sprague et Sandwith, 373.
Cereus aurovillus K. Schum., 456.
 — *pseudomelanostele* Werderm. et Backeb., 457.
Cestrum alternifolium var. *pendulinum* O. E. Schulz, 370.
 Ceylon, rain-forest in, 9.
Chalarothyrsus amplexicaulis Lindau, 65.
 Chandler, S. E., 265.
Chaptalia nutans Polak, 367.
Cheirostylis pauciflora Lindl., 126.
Chelone angustifolia H. B. K., 4.
 — *atropurpurea* Sweet, 5, 6.
 — *campanulata* Cav., 3.
 — *campanuloides* Andr., 5.
 — *elegans* H. B. K., 5, 6.
 — *rosea* Sweet, 5, 7.
Chilenia and *Neoporteria*, 296.
Chilenia Backeb., 297.
Chileniopsis and *Bridgesia*, 300.
Chileniopsis Backeb., 301.
Chiococca parvifolia Wullschl. ex Griseb., 364.
Chronica botanica (review), 265.
Chrysophyllum argenteum Jacq., 367.
Cirrhopetalum elatum Hook. fil., 213.
 — *Wallichii* Lindl., 213.
Citharexylum spinosum Linn., 373.

Clay, S. The present day rock garden (review), 134.
Clematis caracasana DC., 355.
 — *Buchananiana* DC., 294.
 — *Kerriana* Drumm. et Craib, 294.
 — *subpeltata* Wall., 295.
Cleome aculeata Linn., 355.
Clerodendrum calamitosum Linn., 431.
 — *Colebrookianum* Walp., 430.
 — *deflexum* Wall., 424, 426.
 — *disparifolium* Blume, 424, 426, 427.
 — *fragrans* Willd., 425, 430.
 — *Garrettianum* Craib, 424, 427.
 — *glandulosum* Colebr. ex Lindl., 425, 430.
 — *gratum* Kurz, 437.
 — *hastato-oblongum* C. B. Clarke, 428.
 — *indicum* O. Kuntze, 425, 431.
 — *inermis* Gaertn., 424, 425, 426.
 — — var. *neriifolium* Wall., 425.
 — *infortunatum* Linn., 425, 430.
 — *lankawiense* King et Gamble, 426.
 — *lasiocephalum* C. B. Clarke, 425, 430.
 — *Lloydianum* Craib, 424, 427.
 — *macrophyllum* var. *myrmecophilum* Ridley, 428.
 — *neriifolium* Wall. ex Schauer, 424, 425, 426.
 — *nutans* Wall., 427.
 — *paniculatum* Linn., 425, 429.
 — *penduliflorum* Wall. ex Schauer, 424, 427.
 — *Schmidtii* C. B. Clarke, 424, 428.
 — *serratum* Spreng., 425, 428.
 — — var. *Wallichii* C. B. Clarke, 425, 429.
 — *siphonanthus* C. B. Clarke, 431.
 — *umbrosum* King et Gamble, 424, 428.
 — *Vanbrukii* Craib, 425, 428.
 — *venosum* Wall. ex C. B. Clarke, 425, 428.
 — — var. *pubescens* Fletcher, 205, 425, 428.
 — *villosum* Blume, 425, 429.
Clibadium surinamense Linn., 366.
Clidemia hirta D. Don, 361.
 — — var. *elegans* Griseb., 361.
 — *pustulata* DC., 361.
 — *trinitensis* Griseb., 361.
Clinopodium Chamaedrys Vahl, 187.
Clitoria rubiginosa Juss., 359.
Clusia minor Linn., 355.
Cnestis palala Merrill, 275.
Coccoloba venosa Linn., 374.

Codonanthe Eggersii Urb., 371.
Colchicum hiemale Freyn, 468.
 — *Steveni* Kunth, 467.
Coleus Blumei Benth., 188, 373.
Columnnea scandens Linn., 371.
Combretum chinense var. *pubescens*
 King, 283.
 — *sundaicum* Miq., 283.
 Compendium van de Terminologie,
 &c. (review), 308.
Congea azurea Wall., 440.
 — *connata* Fletcher, 208, 440.
 — *siamensis* Fletcher, 209, 440.
 — *tomentosa* Roxb., 439, 440.
 — — var. *azurea* C. B. Clarke,
 439, 440.
 — *villosa* Wight, 439, 440.
 Congress, Stockholm, seventh inter-
 national botanical, 400.
 Conifer names, new, 85.
Connarus euphlebius Merrill, 275.
 — *falcatus* Bl., 275.
 — *grandis* Jack, 275.
 — *Jackianus* Schellenb., 276.
 — *mutabilis* Bl., 276.
 — *odoratus* Hook. fil., 276.
 — *villosus* Jack, 276.
 — *Winkleri* Schellenb., 276.
 Connoisseur, plants for the (review),
 314.
Conostegia icosandra Urb., 361.
 Contributions to the flora of Borneo,
 306.
 Contributions to the flora of Burma,
 294.
 Contributions to the flora of Siam,
 24, 98, 127, 199, 445.
 Contributions to the flora of tropical
 America, 59, 163, 292, 353.
 Convolvulaceae collected by the
 Oxford University Expedition to
 Sarawak, 175.
Convolvulus stoloniferus Cyr., 466.
Copiapoa cinerascens Britt. et Rose,
 298.
Corchorus acutangulus Lam., 229.
 — *aestuosus* Linn., 357.
Cordia Clarkei Brace ex Prain, 211.
 Corkhill, W. J., 133.
Cornutia corymbosa Burm. fil., 418.
 — *quinata* Lour., 434.
 Cotton, A. D., 264.
Coutoubea spicata Aubl., 368.
 Coutts, J., 52.
Craibiodendron Henryi W. W. Smith,
 210.
 — *Mannii* W. W. Smith, 210.
Craniotome versicolor Reichb., 296.
Cratoxylon celebicum Bl., 115.

Cratoxylon cochinchinense var. *calcar-*
eum Ridley, 115.
 — *floribundum* F.-Vill., 115.
 — *formosum* Dyer, 115.
 Critica botanica (review), 217.
 Croizat, L. *Euphorbia* (*Diacanthium*)
 Deightonii, a new succulent from
 West Africa, with brief notes on
 some allied species, 53.
Crossandra Haenkeana Nees, 64.
Crotalaria assamica Benth., 295.
 — *retusa* Linn., 276.
 — *chinensis* Linn., 276.
Croton gossypifolius Vahl, 376.
 — *lobatus* Linn., 376.
 Cultivation of mushrooms, the (re-
 view), 316.
 Cultivation of plants without soil
 (review), 314.
Cuphea denticulata H. B. K., 362.
 — *setosa* var. *glabrescens* Koehne,
 362.
Curculigo scorzonierifolia Baker, 379.
Cyclocarpa stellaris Afzel., 277.
Cynometra Elmeri Merrill, 279.
 — *inaequalifolia* A. Gray, 279.
Cynorchis gabonensis Summerhayes,
 143.
 — *parva* Summerhayes, 148.
Cyphomandra tobagensis Sandwith,
 370.
 Cyprus, additions to the flora of, 460.

D.

Danthonia spicata Beauv., 90.
Daphnopsis caribaea Griseb., 375.
 Das, A., Kanjilal, U. N., and Kanjilal,
 P. C. A flora of Assam (review),
 312.
 Delphinium from Afghanistan, a new
 species of, 86.
Delphinium kabulianum Akhtar, 86.
Deschampsia alpina Roem. et Schult.,
 90.
 — *caespitosa* Beauv., 90.
Desmanthus depressus H. et B., 360.
Desmodium cephalotes Wall., 277.
 — *gangeticum* DC., 277.
 — *laxiflorum* DC., 277.
 — *ovalifolium* Wall., 277.
 — *pulchellum* Desr., 277.
 — *reticulatum* Champ., 277.
Desmoncus horridus Splitg., 380.
Dianthus cyprius A. K. Jackson et
 Turrill, 462.
 Diatoms, index to localities of, 400.
Diceratostele Summerhayes, 151.
 — *gabonensis* Summerhayes, 151.

Dichapetalum tetramerum Ridley, 234.
Dichromena ciliata Vahl, 381.
 — *ebracteata* Standl., 381.
Dicliptera aquatica Leonard, 70.
Didymocarpus Gambleanus C. E. C. Fischer, 36.
 — *lanuginosus* Wight, 37.
 — *macrostachyus* E. Barnes, 37.
 — *Rottlerianus* var. *lanuginosus* C. B. Clarke, 37.
Dimetra Kerr, 127.
 — *Craibiana* Kerr, 127.
Diplacorchis conica Summerhayes, 141.
Dioclea megacarpa Rolfe, 359.
Dioscorea alata Linn., 380.
Diospyros glandulosa Lace, 210.
 — *Vanprukii* Bakh., 24.
 Director, the, 133, 214.
Disa patula var. *transvaalensis* Summerhayes, 148.
 — *stenoglossa* H. Bolus, 149.
 Diseases in Nigeria, a preliminary list of plant, 17.
 Douglas Fir, the botanical name of the, 79.
Drymaria cordata Willd., 355.
Drymonia serrulata Mart., 371.
Dryopteris pyramidata Maxon, 383.
Duguetia tobagensis R. E. Fries, 355.
 Dunn, S. T. (obit.), 214.
Duranta Plumieri Jacq., 411.
Durio cupreus Ridley, 221.

E.

Echinocactus ambiguus Hildm., 298.
 — *Aspillagai* Söhrens, 298.
 — *Cumingii* Hopffer, 300.
 — *Fobeanus* Mieckley, 298.
 — *fuscus* Mühlenpfordt, 298.
 — *Jussieu* Monville, 297.
 — *Kunzii* Först., 298.
 — *napinus* Philippi, 298.
 — *nidus* Söhrens, 297.
 — *occultus* Philippi, 298.
 — *Reichei* K. Schum., 298.
 — *senilis* Philippi, 298.
 — *subgibbosus* Haw., 297.
Echinocalyx Benth., 75.
Echinops niveus Wall., 295.
 Ecological isolation, 384.
 Ecology in town and classroom (review), 172.
Ehretia macrophylla Wall., 211.
Elaeocarpus Beccarii Warb., 234.
 — *brevipes* Merrill, 233.
 — *crassifolius* Ridley, 231.
 — *euneurus* Stapf, 234.

Elaeocarpus Gambir Becc., 233.
 — *glaber* Bl., 234.
 — *Hullettii* King, 234.
 — *insignis* Ridley, 231.
 — *Jackianus* Wall., 234.
 — *lasionyx* Stapf ex Ridley, 232.
 — *luridus* Stapf ex Ridley, 232.
 — *Mastersii* King, 234.
 — *microphyllus* Warb., 234.
 — *ochraceus* Stapf ex Ridley, 230.
 — *parvifolius* Wall., 234.
 — *polyanthus* Ridley, 230.
 — *polycarpus* Stapf ex Ridley, 230.
 — *polystachyus* var. *borneensis* Ridley, 229.
 — *Scortechinii* King, 234.
 — *sphaeroblastus* Stapf ex Ridley, 233.
 — *stipularis* Bl., 233.
 — *tomentosus* Bl., 233.
Elaphoglossum Lingua Brack., 383.
Eleutheranthera ruderalis Sch. Bip., 367.
Ellipanthus Kingii Boerl. et Koord., 275.
 — *sarawakensis* Schellenb., 275.
 Ellis, C., and Swaney, M. W. Soilless growth of plants (review), 314.
Emilia sonchifolia DC., 367.
Entada polystachya DC., 360.
Epidendrum fragrans Sw., 377.
Episcia mimuloides Benth., 371.
 Epling, C. A synopsis of the Labiatae of the Guianas, 187.
Eranthemum ciliatum R. Ben., 212.
 — *fasciculatum* Oerst., 69.
Eremanthus curumbensis Philipson, 298.
 — *pinnatifidus* Philipson, 299.
Erigeron bonariensis Linn., 366.
 — *spatulatus* Vahl, 366.
Erithalis fruticosa Linn., 364.
 — *odorifera* Jacq., 364.
Eryngium foetidum Linn., 363.
Erythroxylum cumanense H. B. K., 357.
 — *ovatum* var. *splendens* O. E. Schulz, 357.
Espostoa Britt. et Rose, 458.
 — *melanosteale* Bullock, 458.
Eucryphia Cav., 318.
 — *Billardieri* Spach, 327.
 — — var. *Milliganii* Benth., 329.
 — *cordata* Cav., 332.
 — *cordifolia* Cav., 331.
 — *glandulosa* Focke, 322.
 — *glutinosa* Baill., 322.
 — — var. *plena* hort., 324.

- Eucryphia lucida* Baill., 326.
 ——— var. *Milliganii* Summerhayes, 329.
 ——— *hybrida* Bausch, 331.
 ——— *intermedia* Bausch, 325.
 ——— *Milliganii* Hook. fil., 329.
 ——— *Moorei* F. Muell., 320.
 ——— *nymansay*, 325.
 ——— *nymansensis* Bausch, 324.
 ——— *patagonica* Speg., 335, 336.
 ——— *pinnatifida* C. Gay, 322.
 ——— *pinnatifolia* C. Gay, 322.
 ——— *Rostrevor*, 325.
Eucryphiaceae, a revision of the, 317.
Eugenia from Assam, a new, 262.
Eugenia assamica Biswas et Purkayastha, 262.
 ——— *monticola* var. *latifolia* Krug et Urb., 361.
 ——— *Cruegeri* Krug et Urb., 361.
Eulophia Helleborina Hook. fil., 143.
Eupatorium inulifolium forma *suaveolens* Hieron., 365.
 ——— *macrophyllum* Linn., 366.
Euphorbia (*Diacanthium*) Deightonii, a new succulent from West Africa, with brief notes on some allied species, 53.
Euphorbia aleppica Linn., 466.
 ——— *Apios* Linn., 467.
 ——— *Barteri* N.E. Br., 54, 55.
 ——— *biglandulosa* Desf., 467.
 ——— *Deightonii* Croizat, 58.
 ——— *garuana* N.E. Br., 54.
 ——— *Hermentiana* Lem., 54.
 ——— *kamerunica* Pax, 53.
 ——— *lasiocarpa* Kl., 375.
 ——— *Maddeni* Boiss., 213.
 ——— *Myrsinites* Linn., 467.
 ——— *Oerstediana* Boiss., 376.
 ——— *thymifolia* Linn., 376.
 ——— *trigona* Haw., 54.
 Evans, G., 350.
Evolvulus sericeus Sw., 369.
Exacum pumilum Griseb., 36.
 Extra-floral nectaries on *Osmanthus* leaves, 254.

F.

- Fagus orientalis* in Greece, on the occurrence of, 38.
Fagus glandulosa Poepp. et Endl., 322.
 ——— *glutinosa* Poepp. et Endl., 322.
 ——— *orientalis* Lipsky, 38.
 ——— *silvatica* Linn., 38.
 Faulkner, O. T., 396.
 Fauna and flora of the Royal Botanic Gardens, Kew, additions to the wild, 390.

- Ficus grenadensis* Warb., 376.
Fimbristylis ferruginea Vahl, 381.
 ——— *monostachya* Hassk., 381.
 Fischer, C. E. C. Plants new to Assam, 210.
 ——— Three new species from Tibet, 285.
Fleurya aestuans Gaud., 376.
 Flora of Assam, a (review), 312.
 ——— of Borneo and other Malay islands, additions to the, 110, 173, 175, 221, 275.
 ——— of Borneo, contributions to the, 306.
 ——— of Burma, contributions to the, 294.
 ——— of Cyprus, additions to the, 460.
 ——— of Siam, contributions to the, 24, 98, 127, 199, 445.
 ——— of the city of Madras (review), 400.
 ——— of the nearer East, on the, 460.
 ——— of tropical America, contributions to the, 59, 163, 292, 353.
 Forest bibliography (review), 88.
 Formation of intumescences containing fatty substances on the stem of *Khaya ivorensis*, the, 137.
 Four new species of *Vernonieae* collected by Glaziou in Brasil, 298.
Fraxinus oxycarpa and *F. Pallisae*, anatomy of, 258.
Fritillaria acmopetala Boiss., 467.
 Fumigation of herbarium specimens, 397.

G.

- Galedupa Echinocalyx* Prain, 75.
 ——— *intermedia* Prain, 75.
 ——— *Wallichiana* Prain, 75.
 Gardener's progress, a (review), 351.
 Gardner, H. M., 265.
Garcinia caudiculata Ridley, 116.
 ——— *calophyllifolia* Ridley, 115.
 ——— *Havilandii* Stapf, 118.
 ——— *lanceola* Ridley, 116.
 ——— *memecyloides* Ridley, 117.
 ——— *minimiflora* Ridley, 118.
 ——— *umbellulata* Ridley, 117.
 ——— *vidua* Ridley, 115.
Garrettia siamensis Fletcher, 437.
Gastrochilus pseudodistichus Schlechter, 213.
Gentiana Amarella var. *uliginosa* Wahlenb., 90.
 ——— *serra* Franch., 296.
Geranium columbinum Linn., 464.
Geum heterocarpum Boiss., 465.

Geunsia farinosa Bl., 415.
 ——— var. *typica* forma *farinosa* Bakh., 415.
 ——— *pentandra* Merrill, 415.
 Gibbins, C. B., 397.
 Glaziou in Brasil, four new species of Vernonieae collected by, 298.
Gleichenia bifida Spreng., 384.
 ——— *flexuosa* Mett., 384.
Glossocarya crenata Fletcher, 205, 437, 438.
 ——— *longiflora* Fletcher, 205, 437, 438.
 ——— *mollis* Wall. ex Griff., 437.
 ——— *premnoideis* Ridley, 437, 438.
 ——— *siamensis* Craib, 437, 438.
Gmelina arborea Roxb., 422.
 ——— *asiatica* Linn., 422, 423.
 ——— var. *philippinensis* Bakh., 423.
 ——— var. *typica* Bakh., 423.
 ——— var. *villosa* Bakh., 423.
 ——— *attenuata* Fletcher, 203, 422.
 ——— *Hystrix* Schult. ex Kurz, 422.
 ——— *paniculata* Fletcher, 204, 422.
 ——— *tomentosa* Fletcher, 204, 422, 423.
 ——— *villosa* Roxb., 422, 423.
Gnoteris Raf., 189.
Gonzalagunia spicata Maza, 364.
Gonolobus ciliatus Schlechter, 368.
 ——— *tobagensis* Urb., 368.
 ——— *viridiflorus* Roem. et Schult. 368.
Gouania polygama Urb., 358.
 Goulding, E. (obit.), 133.
 Grebenchikoff, O. On the occurrence of *Fagus orientalis* in Greece, 38.
 Greece, on the occurrence of *Fagus orientalis* in, 38.
 Green, M. L., and Sprague, T. A. The botanical name of the Douglas fir, 79.
 Greenland, 1937, notes on a botanical journey in S.W., 89.
 Greenway, P. J. A Swahili dictionary of plant names (review), 87.
Grewia glabra Bl., 229.
 ——— *umbellata* Roxb., 229.
 Grey, C. H. Hardy bulbs (review), 170.
 Grove, W. B. (obit.), 82.
 Growth of plants, soilless (review), 314.
 Guianas, a synopsis of the Labiatae of the, 187.
Guettarda parviflora Vahl, 364.
 ——— *scabra* Lam., 364.
Guilandina Wallichiana Graham, 75.
 Gustafsson, C. E. Notes on African Rubi in the Kew herbarium, 177.

Guttiferae, the genus *Tetralthalamus* excluded from, 458.
Gymnadenia macrantha Lindl., 143.
Gymnanthera insularum King et Gamble, 447.
Gymnemopsis calcicola Kerr, 451.

H.

Haageocereus Backeb., 457.
 ——— *auricolor* Backeb., 455.
 ——— *pseudomelanostele* Backeb., 457.
 ——— *rigidissimus* Backeb., 455.
Habenaria alata Hook., 377.
 ——— *ceratopetala* A. Rich., 144.
 ——— *cornuta* Lindl., 144.
 ——— *cornutella* Summerhayes, 144.
 ——— *dactylostigma* Schlechter, 146.
 ——— *gabonensis* Reichb. fil., 144.
 ——— *Helleborina* Nichols., 143.
 ——— *hetaeroides* Summerhayes, 147.
 ——— *Lelyi* var. *macroceras* Summerhayes, 148.
 ——— *Linderi* Summerhayes, 146.
 ——— *microsaccus* Kraenzl., 146.
 ——— *Milnei* Reichb. fil., 144.
 ——— *parva* Summerhayes, 148.
 ——— *psiloceras* Welw. ex Reichb. fil., 144.
 ——— *Staudtiana* Kraenzl., 144.
 ——— *Staudtii* Kraenzl. ex Rolfe, 144.
 ——— *stenorhynchus* Schlechter, 146.
 ——— *subcornuta* Schlechter, 144.
 Hardy bulbs (review), 170.
 Harnett, J., and Bewley, W. F. The cultivation of mushrooms (review), 316.
 Hay, T., 265.
 ——— Plants for the connoisseur (review), 314.
Hedychium venustum Wight, 213.
Heliconia hirsuta Linn. fil., 378.
 ——— *psittacorum* Linn. fil., 379.
Henrietta multiflora Naud., 362.
 Herbal, an artist's (review), 172.
 Herbals (review), 307.
 Herbarium specimens and gas-poisoning, 397.
Heteropteris macrostachya Juss., 357.
Hibiscus radiatus Cav., 221.
Hippocratea brachystachys Ridley, 241.
 ——— *indica* Willd., 242.
 ——— *macrantha* Korth., 242.
 ——— *trilobulata* Ridley, 241.
 ——— *volubilis* Linn., 358.
Hippothronia Benth., 189.
Hirtella silicea Griseb., 360.
 ——— *triandra* Sw., 360.

Hole, R. S. (obit.), 305.
 Holman, R. M., and Robbins, W. W.
 A textbook of general botany
 (review), 351.
 ———, Roush, L., and Bonar, L. A
 laboratory guide for a course in
 general botany (review), 316.
Homalium calciphilum Ridley, 112.
 ——— *caryophyllaceum* Benth., 111.
 ——— *frutescens* Warb., 111.
 ——— *Hosei* Merrill, 111.
 ——— *obovale* Teyssm., 111.
 Hort, A. The "Critica Botanica"
 of Linnaeus (review), 217.
 Horticultural autobiography, a (re-
 view), 351.
 Hubbard, C. E. Notes on the flora of
 Tobago: Gramineae, 382.
Hymenopyramis acuminata Fletcher,
 206, 438.
 ——— *brachiata* Wall. ex Kurz, 438,
 439.
 ——— *cana* Craib, 438, 439.
 ——— *siamensis* Craib, 438, 439.
 ——— *vesiculosa* Fletcher, 206, 438.
Hypoestes triflora Roem. et Schult.,
 296.
Hypothronia Schrank, 189.
Hypoxis decumbens Linn., 379.
Hyptis Jacq., 189.
 ——— *acuta* Benth., 195.
 ——— *arborea* Benth., 190, 191.
 ——— ——— subsp. *bracteosa* Briq., 191.
 ——— ——— subsp. *guianensis* Briq.,
 191.
 ——— *aspera* Mart. et Gal., 193.
 ——— *atrorubens* Poit., 196, 373.
 ——— *barbata* Schrank, 193.
 ——— *brevipes* Poit., 195.
 ——— ——— var. *glabrior* Benth., 195.
 ——— ——— var. *lanceifolia* Briq., 195.
 ——— ——— var. *remotidens* Briq., 195.
 ——— ——— var. *serrata* Briq., 195.
 ——— *canaminensis* Rusby, 193.
 ——— *canescens* Kunth, 193.
 ——— ——— var. *arvensis* Benth., 193.
 ——— *capitellata* Jenn., 194.
 ——— *Chamaedrys* Willd., 188.
 ——— *crenata* var. *angustifolia* Benth.,
 194.
 ——— *congesta* Leonard, 192.
 ——— *dilatata* Benth., 194.
 ——— *globifera* G. F. W. Meyer, 195.
 ——— *hirsuta* Kunth, 195.
 ——— *inflata* Spreng., 188.
 ——— *inundata* Hertzog, 194.
 ——— *juruana* Loesn. ex Pilger, 196.
 ——— *laciniata* Benth., 193.
 ——— *lanceifolia* Thonn., 195.

Hyptis lanceolata Poir., 195.
 ——— *lantanifolia* Poit., 196.
 ——— ——— var. *glabra* Kosterm., 196.
 ——— *lurida* Spreng., 188.
 ——— *melanosticta* Griseb., 195.
 ——— *micrantha* Pohl ex Benth., 193.
 ——— *microcephala* Bert. ex Benth.,
 194.
 ——— *microphylla* Pohl ex Benth.,
 194.
 ——— *mutabilis* Brig., 192.
 ——— ——— var. *Bromfieldi* Briq., 192.
 ——— ——— var. *canescens* Briq., 193.
 ——— ——— var. *cuneata* Briq., 193.
 ——— ——— var. *micrantha* Briq., 193.
 ——— ——— var. *Pavoniana* Briq., 193.
 ——— ——— var. *polystachya* Briq., 193.
 ——— ——— var. *rostrata* Briq., 192.
 ——— ——— var. *spicata* Briq., 192.
 ——— *nepetoides* Fisch. ex Schrank,
 192.
 ——— *paludosa* St. Hil. ex Benth., 194.
 ——— *Parkeri* Benth., 196.
 ——— ——— var. *verbenifolia* Epl., 196.
 ——— *pascuorum* Mart. ex Schmidt,
 196.
 ——— *pectinata* Poit., 190, 192, 373.
 ——— *Plumieri* Poit., 192.
 ——— *polystachya* Kunth, 193.
 ——— ——— var. *longiflora* Benth., 193.
 ——— *procumbens* Cham. et Schlecht.,
 196.
 ——— *pseudo-chamaedrys* Poit., 188.
 ——— *recurvata* Poit., 194.
 ——— ——— var. *grandifolia* Benth.,
 194.
 ——— ——— var. *hirsutior* Benth., 194.
 ——— *rostrata* Salzmann ex Benth., 192.
 ——— *Salzmanni* Benth., 190, 191.
 ——— ——— var. *filipes* Benth., 191.
 ——— *singularis* Glaziov., 192.
 ——— *siderotricha* Briq., 195.
 ——— *spicata* Poit., 192.
 ——— ——— var. *Bromfieldi* Benth.,
 193.
 ——— ——— var. *micrantha* Benth., 192.
 ——— ——— var. *rostrata* Benth., 192.
 ——— *suaveolens* Poit., 190, 192.
 ——— *tenella* Briq. et Spruce, 196.
 ——— *tenuiflora* Benth., 192.
 ——— *trichocalyx* Briq. ex Micheli,
 193.
 ——— *verbenifolia* Mart. ex Schmidt,
 196.

I.

Ichmanthus pallens Munro, 382.
Illigera villosa C. B. Clarke, 212.

Impatiens Akka Bedd., 34.
 — *biflora* Walt., 161, 162.
 — *capensis* Meerburgh, 162.
 — *Duthieae* L. Bolus, 162.
 — *fulva* Nutt., 161, 162.
 — *Marlothiana* G. M. Schulze, 162.
 — *munarensis* E. Barnes, 32.
 — *pandata* E. Barnes, 33.
 India, new or little known plants
 from southern, 32, 123.
Indigofera tinctoria Linn., 276.
Inga punctata Willd., 360.
 International botanical congress,
 Stockholm, seventh, 400.
Ipomoea littoralis Boiss., 466.
 — *stolonifera* J. F. Gmel., 466.
 — *triloba* Linn., 369.
Isachne disperma Doell., 383.
 Isolation, ecological, 384.

J.

Jackson, A. K., and Turrill, W. B.
 Additions to the flora of Cyprus,
 460.
Jacobinia capitata Leonard, 71.
Jacquemontia elongata Britton, 369.
 — *tomentella* var. *micrantha* H.
 Hallier, 175.
Jacquinia Barbasco Mez, 367.
 — *revoluta* Jacq., 367.
Jasminum calcicolum Kerr, 26.
 — *carissoides* Kerr, 27.
 — *Craibianum* Kerr, 27.
 — *dumicola* W. W. Smith, 210.
 — *insularum* Kerr, 28.
 — *plumosum* Kerr, 28.
 — *Putii* Kerr, 29.
 — *rarum* Kerr, 29.
 — *sempervirens* Kerr, 30.
 — *stellipilum* Kerr, 30.
 — *trangense* Kerr, 31.
 — *virgatum* Kerr, 31.
 Jones, G. A., 265, 397.
Justicia comata Lam., 373.

K.

Kanjilal, P. C., Kanjilal, U. N., and
 Das, A. A flora of Assam (review),
 313.
 Kanjilal, U. N., Kanjilal, P. C., and
 Das, A. A flora of Assam (review),
 312.
Kayea calophylloides Ridley, 123.
 — *oblongifolia* Ridley, 122.
 — *paniculata* Merrill, 123.
 Kew, the ants of the Royal Botanic
 Gardens, 390.
Khadia carolinensis L. Bolus, 160.

Khaya ivorensis, the formation of
 intumescences containing fatty
 substances on the stem of, 137.
Khaya ivorensis A. Chev., 137.
 — *senegalensis* DC., 137.
Kokoona lanceolata Ridley, 237.
 — *ovato-lanceolata* Ridley, 236.
Knema glauca Warb., 307.
Krugia ferruginea Urb., 360.
Kurrimia minor Ridley, 235.
 — *paniculata* Wall., 235.
Kyllinga monocephala Rottb., 381.

L.

Labiatae of the Guianas, a synopsis
 of the, 187.
 Laboratory guide for a course in
 general botany, a (review), 316.
Lachemilla arborescens Rothm., 270.
 — *frigida* Rothm., 271.
 — *galioides* Rothm., 271.
 — *Hultenii* Rothm., 272.
 — *Mutellina* Rothm., 271.
 — *Perryana* Rothm., 271.
 — *pseudovenusta* Rothm., 271.
 — *Steinbachii* Rothm., 271.
 — *Trevirani* Rothm., 271.
Lactuca triquetra Boiss., 465.
Lagenandra toxicaria var. *Barnesii*
 C. E. C. Fischer, 126.
Lantana aculeata Linn., 410.
 — *Camara* Linn., 410.
 — *indica* Roxb., 410.
 — *mixta* Linn., 410.
 — *salviifolia* Jacq., 410.
Lasiacis divaricata Hitchcock, 382.
 Leckie, W. G., 265.
 Lectotypes of *Nananthus* and
Aloinopsis, 153.
 Leonard, E. C. *Plantae hintonianae* :
Acanthaceae, 59.
Leonotis nepetifolia R.Br., 187.
Leonurus sibiricus Linn., 187.
Lepidagathis alopecuroidea Griseb.,
 373.
Leptochloa virgata Beauv., 382.
Leucaena glauca Benth., 360.
 Lily year-book, the (review), 171.
Lindenbergia philippensis Benth., 211.
 Linnaeus, the "Critica Botanica" of
 (review), 217.
Linociera calcicola Kerr, 129.
 — *caribaea* Knobl., 367.
 — *eriorrhachis* Kerr, 130.
 — *microbotrya* Kerr, 130.
 — *procera* Kerr, 131.
 — *sutepensis* Kerr, 131.
 — *velutina* Kerr, 132.

Lippia nodiflora Rich., 410.
Lithocarpus aggregatus Barnett, 104.
 — *Craibianus* Barnett, 103.
 — *Falconeri* Rehder, 102, 472.
 — *lappaceus* Rehder, 100, 472.
 — *longispinus* Barnett, 100.
 — *intermedius* Barnett, 101.
 — *pattaniensis* Barnett, 104.
 — *recurvatus* Barnett, 101.
 — *rufescens* Barnett, 102.
Lobivia Britt. et Rose, 300.
Lobularia maritima Desv., 461.
Loxanthocereus Backeb., 457.
Lycianthes pauciflora subsp. *tobagoënsis* Bitt., 369.
Lycopsis arvensis Linn., 211.

M.

McFarland, J. H., and Pyle, R.
 How to grow roses (review), 136.
Maba inconstans Griseb., 367.
 Mainland, A. M. Index to localities of diatoms, 400.
Malacocarpus napinus Britt. et Rose, 298.
 — *Reichei* Britt. et Rose, 298.
Malanea macrophylla Bartl., 364.
 Malayan species of *Sindora*, a note on certain, 73.
 Malay islands, additions to the flora of Borneo and other, 110, 173, 175, 221, 275.
Malvastrum coromandelianum Garcke, 356.
Mandevilla hirsuta K. Schum., 368.
 — *subsagittata* Woodson, 368.
 Mansfield, L. An artist's herbal (review), 172.
Maranta gibba Sm., 378.
Marcgravia tobagensis Urb., 356.
Marila grandiflora Griseb., 355.
 Marquand, C. V. B., and Bullock, A. A. *Callicarpa* subpubescens Hook. et Arn., 399.
Marsdenia calcicola Kerr, 452.
 — *eriocaulis* Kerr, 452.
 — *macrophylla* Fourn., 368.
 — *maculata* Hook., 368.
 Marsden-Jones, E. M., and Turrill, W. B. Researches on *Silene maritima* and *S. vulgaris*: xxi. Further research on the genetics of anthocyanin and other characters in *S. maritima*, 248.
Marssonina subacaulis Urb., 371.
Marsypianthes Chamaedrys O. Kuntze, 187.
 — *hyptoides* Mart. ex Benth., 187.

Marsypianthes hyptoides var. *arenosa* Benth., 188.
 — — var. *bracteosa* Benth., 188.
 — — var. *eriocephala* Benth., 188.
 — — var. *umbrosa* Benth., 188.
 — *viscosa* Klotzsch, 188.
Martinella obovata Bur. et K. Schum., 372.
Matucana Britt. et Rose, 301.
Maxillaria liparophylla Summerhayes, 377.
Medinilla malabarica Bedd., 124.
 Meerburgh's *Impatiens capensis*, 161.
Meladerma Kerr, 445.
 — *deciduum* Kerr, 447.
 — *insularum* Kerr, 447.
 — *puberulum* Kerr, 447.
Melanthera nivea O. E. Schulz, 366.
Melothria guadalupensis Cogn., 362.
Merremia dissecta Hall. fil., 369.
 — *Korthalsiana* van Ooststr., 175.
 — *umbellata* Hall. fil., 369.
 Merrill, E. D., and Walker, E. H. A bibliography of Eastern Asiatic botany (review), 310.
 Mesembryanthemaeae, notes on, 153.
Mesembryanthemum Linn., 153.
 — *albinotum* Haw., 159.
 — *albipunctum* Haw., 159.
 — — var. *majus* Haw., 159.
 — *aloides* Haw., 158, 159.
 — *carolinense* L. Bolus, 160.
 — *cibdelum* N. E. Br., 159.
 — *crassipes* Marloth, 158.
 — *rosulatum* Kensit, 158.
 — *rubrolineatum* N. E. Br., 159.
 — *transvaalense* Rolfe, 158.
 — *vittatum* N. E. Br., 158.
Mesosphaerum P. Br., 189.
 — *arborescens* O. Kuntze, 191.
 — — var. *bracteosum* Rusby, 191.
 — *atro-rubens* O. Kuntze, 196.
 — *barbatum* O. Kuntze, 193.
 — *brevipes* O. Kuntze, 195.
 — *canescens* O. Kuntze, 193.
 — *capitellatum* Jenn., 194.
 — *dilatatum* O. Kuntze, 194.
 — *graveolens* O. Kuntze, 192.
 — *hirsutum* O. Kuntze, 195.
 — *laciniatum* O. Kuntze, 193.
 — *lanceolatum* O. Kuntze, 195.
 — *lantaniifolium* O. Kuntze, 196.
 — *melanostictum* O. Kuntze, 195.
 — *microphyllum* O. Kuntze, 194.
 — *mutabile* O. Kuntze, 192.
 — *paludosum* O. Kuntze, 194.

Mesosphaerum Parkeri O. Kuntze, 196.
 — *pectinatum* O. Kuntze, 192.
 — *polystachyum* Cook et Collins, 193.
 — *recurvatum* O. Kuntze, 194.
 — *Salzmanni* O. Kuntze, 191.
 — *siderotrichum* Briq., 195.
 — *spicatum* Rusby, 192.
 — *tenellum* Briq., 196.
 — *verbenifolium* O. Kuntze, 196.
 — *yungasense* Britton ex Rusby, 193.
Metastelma decipiens Schlechter, 368.
 Metcalfe, C. R. Anatomy of *Fraxinus oxycarpa* and *F. Pallisae*, 258.
 — Extra-floral nectaries on *Osmanthus* leaves, 254.
 Mexican Society of Natural History, 472.
Miconia hypoleuca Triana, 361.
 — *laevigata* DC., 361.
Microcos gracilis Stapf ex Ridley, 229.
 — *Havilandii* Ridley, 228.
 — *laurifolia* Burret, 228.
 — *subpetala* Stapf ex Ridley, 228.
Mikania micrantha H. B. K., 366.
 — *scabra* DC., 366.
Mimosa sepiaaria Benth., 280.
 — *pudica* Linn., 360.
Mirabilis Jalapa Linn., 212.
Monadenia leydenbergensis Kraenzl., 149.
 Monkeys, botanical, 306.
Monstera Fendleri Engl., 381.
 — *obliqua* Walp., 381.
 — *pertusa* de Vriese, 381.
 Morton, C. V. New Mexican Gesneriaceae, 292.
Mucuna acuminata Grah., 277.
 — *monosperma* Roxb., 277.
Muntingia Calabura Linn., 357.
 Mushrooms, the cultivation of (review), 316.
Myxopyrum confertum Kerr, 133.

N.

Nananthus N. E. Br., 153.
 — *albinotus* L. Bolus, 159.
 — *albipunctus* Schwantes, 159.
 — *aloides* Schwantes, 158.
 — *cibdelus* Schwantes, 159.
 — *Comptonii* L. Bolus, 160.
 — *difformis* L. Bolus, 160.
 — *Dyeri* L. Bolus, 159.
 — *Orpenii* L. Bolus, 161.
 — *Peersii* L. Bolus, 160.

Nananthus Pole-Evansii N. E. Br., 159.
 — *rubrolineatus* Schwantes, 159.
 — *vittatus* Schwantes, 158.
Napeanthus subacaulis Benth et Hook. fil. ex O. Kuntze, 371.
Nectandra coriacea Griseb., 375.
 Nectaries on *Osmanthus* leaves, extra-floral, 254.
 Nelmes, E. Notes on *Carex*, 106, 242.
 Neoporteria and *Chilenia*, 296.
Neoporteria Britt. et Rose, 297.
 — *chilensis* Britt. et Rose, 297.
 — *fusca* Britt. et Rose, 298.
 — *Jussieui* Britt. et Rose, 297.
 — *nidus* Britt. et Rose, 298.
 — *nigricans* Britt. et Rose, 298.
 — *occulta* Britt. et Rose, 298.
 — *senilis* Backeb., 298.
 — *subgibbosa* Britt. et Rose, 297.
Nepeta mutabilis L. C. Rich., 192.
 — *pectinata* Linn., 192.
Nervilia subintegra Summerhayes, 150.
 New or little known plants from southern India, 123.
 New York Botanical Garden, 52.
Nichelia Bullock, 297.
 — *fusca* Bullock, 298.
 — *Jussieui* Bullock, 297.
 — *nidus* Bullock, 297.
 — *nigricans* Bullock, 298.
 — *occulta* Bullock, 298.
 Nigeria, a preliminary list of plant diseases in, 17.
 Note on certain Malayan species of *Sindora*, a, 73.
 Notes on *Xylocarpus*, 288.

O.

Oberonia brevifolia Lindl., 153.
 — *disticha* Schlechter, 152.
 Obituary notices :—
 Bailey, J. F., 350.
 Boulenger, G. A., 84.
 Burt, B. D., 301.
 Dunn, S. T., 214.
 Grove, W. B., 82.
 Goulding, E., 133.
 Hole, R. S., 305.
 Rendle, A. B., 81.
 Rogers, C. G., 84.
 Thompson, H. N., 303.
 Zahlbruckner, A., 304.
Ocimum Basilicum Linn., 188, 189.
 — *gratissimum* Linn., 188.
 — *micranthum* Willd., 188, 189, 373.
 — *sanctum* Linn., 188, 189.

Ocotea leucoxylon Mez, 375.
Odontonema brevipes Urb., 373.
Olea fragrans Thunb., 254.
Olyra latifolia Linn., 383.
Ooststroom, S. J. van. Convolvulaceae collected by the Oxford University Expedition to Sarawak, 175.
Operculina alata Urb., 369.
Ophiorrhiza caudata C. E. C. Fischer, 125.
—— *incarnata* C. E. C. Fischer, 124.
—— *munnarensis* C. E. C. Fischer, 35.
Ornithopus compressus Linn., 464.
Orchids, African, 141.
Osbeckia aspera Wight et Arn., 34.
—— *glauca* Benth., 34.
—— *kewensis* C. E. C. Fischer, 34.
—— *reticulata* Bedd., 124.
—— *truncata* D. Don ex Wight et Arn., 123.
—— *wynaadensis* C. B. Clarke, 35.
Osmanthus leaves, extra-floral nectaries on, 254.
—— *fragrans* Lour., 254.
—— *ilicifolius* Mouillef., 254.
Ossowski, A. The formation of intumescences containing fatty substances on the stem of *Khaya ivorensis*, 137.
Oxford University Expedition to Sarawak, 1932, Convolvulaceae collected by the, 175.

P.

Palaquium rivulare H. J. Lam, 307.
Panicum fasciculatum Sw., 382.
—— *maximum* Jacq., 382.
Paracryphia Bak. fil., 336.
Paravallaris macrophylla Pierre, 295.
Paravitex siamica Fletcher, 437.
Parkia speciosa Hassk., 280.
Paspalum decumbens Sw., 382.
—— *paniculatum* Linn., 382.
—— *saccharoides* Linn., 382.
—— *vaginatatum* Sw., 382.
Passiflora cyanea Mast., 362.
—— *laurifolia* Linn., 362.
—— *tuberosa* Jacq., 362.
Paullinia excisa Radlk., 358.
Pavonia fruticosa Fawc. et Rendle, 356.
—— *Typhalaea* Cav., 356.
Pectis humifusa Sw., 366.
Pedicularia curvipes Hook. fil., 211.
Pedilanthus versus Tithymalus, 468.
Pedilanthus Neck., 468.

Pellacalix cristatus Hemsl., 282.
—— *Lobbii* Schimp., 282.
Pellinia Molina, 318.
—— *chilensis* Molina, 332.
—— *cordifolia* Molina, 332.
Pennisetum polystachyon Schult., 383.
—— *setosum* L. Rich., 383.
Penstemon campanulatus and *P. Kunthii*, 1.
Penstemon angustifolius Poir., 4.
—— *campanulatus* Willd., 3.
—— *Gentryi* Standley, 3.
—— *Kunthii* G. Don, 4.
—— *pulchellus* Lindl., 3.
Pentace cordifolia Ridley 227.
Peperomia emarginella C. DC., 374.
—— *rotundifolia* var. *ovata* Dahlst. ex C. DC., 374.
Periploca purpurea Kerr, 448.
Petiveria alliacea Linn., 374.
Petraea volubilis Linn., 411.
Petroselinum anaticum Freyn et Sint., 258.
—— *crispum* auct. kew. 257.
—— ——— var. *anaticum* Airy-Shaw, 258.
—— ——— var. *crispum* Airy-Shaw, 257.
—— ——— var. *latifolium* Airy-Shaw, 258.
—— *hortense* var. *crispum* L. H. Bailey, 258.
—— ——— var. *latifolium* Wolff, 258.
—— *Petroselinum* Karst., 257.
—— *sativum* var. *crispum* Gaudin, 257.
—— ——— var. *latifolium* Gaudin, 258.
—— ——— var. *silvestre* Alef., 258.
—— ——— var. *vulgare* Alef., 258.
—— ——— subvar. *crispum* Coss. et Germ., 257.
—— ——— subvar. *latifolium* Coss. et Germ., 258.
—— *vulgare* var. *crispum* S. F. Gray, 257.
—— ——— var. *latifolium* S. F. Gray, 258.
Pharus latifolius Linn., 382.
Phaseolus luteus Bl., 277.
Phenax Sonneratii Wedd., 377.
Philipson, W. R. Four new species of *Vernoniae* collected by Glaziou in Brasil, 298.
Philoxerus vermicularis Pal., 374.
Phinsea multiflora Morton, 292.
Phlogacanthus pubinervius T. And., 296.
Phoradendron pipervoides Trel., 375.
—— *trinervium* Griseb., 375.

Phthirusa pyrifolia Eichl., 375.
 — *Theobromae* Eichl., 375.
Phyllanthus acuminatus Vahl, 376.
 — *Niruri* Linn., 376.
Phyllomphax galeandra Schlechter, 213.
 — *Helleborina* Schlechter, 143.
 — *macrantha* Summerhayes, 143.
Picea Abies var. *acrocona* Dallimore, 85.
 — — var. *brevifolia* Dallimore, 85.
 — — forma *albida* Dallimore, 85.
 — — forma *argentea* Rehd., 85.
 — *excelsa* var. *brevifolia* Hornbrook, 85.
 — — forma *acrocona* Th. M. Fries, 85.
 — — forma *argentea* Hornbrook, 85.
Picramnia tetrandra Sw., 358.
Pilea inaequalis Wedd., 377.
 — *microphylla* Liebm., 377.
 — *tobagensis* Urb., 377.
Pinus Chylla Lodd., 85.
 — *Dicksonii* hort. ex Carrière, 85.
 — *excelsa* Wall. ex Lamb., 85.
 — — *zebrina* Beissner, 85.
 — *Griffithii* McClelland, 85.
 — *nepalensis* De Chambr., 85.
 — — var. *zebrina* L. H. Bailey, 85.
 — *Strobilus excelsa zebrina* Croux ex Bailly, 85.
 — *taxifolia* Lamb., 80.
 — *Wallichiana* A. B. Jackson, 85.
 — — forma *zebrina* A. B. Jackson, 85.
Piper peltatum Linn., 374.
 — *Schackii* C. DC., 374.
 — *tobagoanum* C. DC., 374.
Pisonia fragrans Dum. Cours., 373.
 Plant diseases in Nigeria, a preliminary list of, 17.
 Plants for the connoisseur (review), 314.
 — new to Assam, 210.
Platanthera Helleborina Rolfe, 143.
 — *macrantha* Kraenzl., 143.
Platycentrum clidemioides Naud., 361.
Plectranthus scrophularioides Wall., 212.
Pleurothallis ovalifolia Reichb. fil., 377.
Pogostemon nigrescens Dunn, 212.
 — *Wattii* C. B. Clarke, 296.
 Poisoning of herbarium specimens, 397.

Polunin, N. Notes on a botanical journey in S.W. Greenland, 1937, 89.
 Poplars, the black (review), 313.
Porophyllum ellipticum Cass., 366.
Portulaca oleracea Linn., 464.
 — *Wightiana* Wall., 123.
Potamogeton natans Linn., 90.
Premna amplexans Schau., 417, 421.
 — *angustior* Ridley, 419.
 — *annulata* Fletcher, 199, 417, 421.
 — *Collinsae* Craib, 416, 419.
 — *cordifolia* Roxb., 416, 418.
 — *coriacea* var. *oblonga* C. B. Clarke, 415, 417.
 — *corymbosa* Rottl. et Willd., 416, 418.
 — — var. *angustior* Fletcher, 416, 419.
 — — var. *minor* Fletcher, 416, 419.
 — — var. *obtusifolia* Fletcher, 416, 419.
 — *dubia* Craib, 415, 417.
 — *flavescens* Ham. ex C. B. Clarke, 416, 420.
 — — var. *glabrior* C. B. Clarke, 416, 420.
 — *foetida* Reinw. ex Blume, 416, 418.
 — *fulva* Craib, 416, 420.
 — *Garrettii* Fletcher, 200, 415, 418.
 — *herbacea* Roxb., 417, 421.
 — *integrifolia* Linn., 418, 419.
 — — var. *angustior* C. B. Clarke, 419.
 — — var. *minor* Ridley, 419.
 — — var. *obtusifolia* P'ei, 419.
 — *latifolia* Roxb., 416, 420.
 — — var. *cuneata* C. B. Clarke, 416, 420.
 — — var. *mucronata* C. B. Clarke, 416, 420.
 — *mucronata* Roxb., 420.
 — *nana* Coll. et Hemsl., 417, 421.
 — *obtusifolia* R.Br., 419.
 — *paniculata* Fletcher, 201, 417, 421.
 — *parasitica* Blume, 418.
 — *pyramidata* Wall. ex Schauer, 416, 419.
 — *quadridentata* Fletcher, 201, 417, 421.
 — *racemosa* Wall. ex Schauer, 415, 417.
 — *repens* Fletcher, 202, 417, 421.
 — *scandens* Roxb., 415, 417.
 — *serrata* Fletcher, 202, 417, 421.
 — *serratifolia* Linn., 418.

- Premna siamensis* Fletcher, 203, 417, 421.
 — *tomentosa* Willd., 419.
 — *trichostoma* Miq., 416, 418.
 — *viburnoides* Wall., 420.
 — *villosa* C. B. Clarke, 415, 418.
 Prescott, J. A., 214.
Prestonia exserta Standl., 368.
 — *tobagensis* Urb., 368.
Proteopsis Ekmaniana Philipson, 300.
 — *insculpta* Philipson, 299.
 — *lanuginosa* Philipson, 300.
Pseuderanthemum axillare Leonard, 68.
 — *fasciculatum* Leonard, 69.
Pseudoëspostoa Backeb., 458.
 — *melanostele* Backeb., 458.
Pseudotsuga Douglasii Carr., 80.
 — — var. *pumila* Beissner, 85.
 — *mucronata* Sudw., 80.
 — *taxifolia* Britton, 80.
 — *taxifolia* Rehder, 80.
 — — var. *pumila* M. L. Green, 85.
Psychotria pendula Urb., 365.
 — *tobagensis* Urb., 365.
 — *uliginosa* Sw., 365.
Pueraria phaseoloides Benth., 277.
 Pulle, A. A. Compendium van de Terminologie, &c. (review), 308.
Pycnanthemum subulatum Blanco, 195.
Pygeum Beccarii Ridley, 281.
 — *Havilandii* Ridley, 281.
 — *Hookerianum* var. *borneense* Ridley, 281.
 — *lampongum* Miq., 282.
 — *parviflorum* Miq., 282.
 — *stipulaceum* King, 282.
 Pyle, R., and McFarland, J. H. How to grow roses (review), 136.
Pyrethrum Balsamita var. *tanacetoides* Boiss., 466.

Q.

- Quercus glabricupula* Barnett, 99.
 — *Falconeri* Kurz, 472.
 — *lappacea* Roxb., 472.
 — *lenticellata* Barnett, 98.
 — *longistyla* Barnett, 100.
 — *wangsaiensis* Barnett, 99.

R.

- Rabiea* N. E. Br., 156.
 — *albinota* N. E. Br., 159.
 — *albipuncta* N. E. Br., 159.
 — *carolinensis* N. E. Br., 160.
 — *cibdela* N. E. Br., 159.

- Rabiea Lesliei* N. E. Br., 160.
 — *tersa* N. E. Br., 160.
Raddia guianensis Hitchcock, 383.
 Rain-forest in Ceylon, 9.
 Ramayya, K., 265.
Ranunculus bullatus Linn., 461.
 — *Ficaria* Linn., 461.
 — — var. *grandiflorus* Schultz, 461.
Rauwolfia Lamarckii DC., 367.
 Rendle, A. B. (obit), 81.
Renalmia bracteosa Griseb., 378.
 Revision of the Eucryphiaceae, a, 317.
Rhododendron taiense Hutch., 24.
Rhynchospora polyphylla Vahl, 381.
 Richardson, A. E. V., 214.
 Ripon professorship, the, 133.
Rivina humilis Linn., 374.
 Ridley, H. N. Additions to the flora of Borneo and other Malay islands, 110, 173, 221, 275.
 — Notes on *Xylocarpus*, 288.
 — Two new names in *Aglaia*, 215.
 Robbie, J., 133.
 Robbins, W. J., 52.
 Robbins, W. W., and Holman, R. M. A textbook of general botany, 351.
 Rock garden, the present day (review), 134.
 Rogers, C. G. (obit.), 84.
Rolandra fruticosa O. Kuntze, 365.
 Roses, how to grow (review), 136.
 Rothmaler, W. *Alchemillae novae*, 269.
Roureaopsis javanica Planch., 275.
 Roush, L., Holman, R. M., and Bonar, L. A laboratory guide for a course in general botany (review), 316.
 Rubi in the Kew herbarium, notes on African, 177.
Rubus sect. *Afro-digitati* C. E. Gust., 178.
 — — *Afro-idaei* Focke, 179.
 — — *Afro-montani* Focke, 177.
 — *adenocomus* Focke, 180.
 — *adenophloeus* Focke, 179.
 — *Adolfi-Friederici* Engl., 180.
 — *alceifolius* Poir., 280.
 — *angulosus* Focke, 280.
 — *apetalus* Poir., 180.
 — — var. *roseus* C. E. Gust., 182.
 — *assaortinus* Chiov., 181.
 — *atrocoeruleus* C. E. Gust., 185.
 — *borbonicus* Pers., 180.
 — *Chiesae* Chiov., 178.
 — *Chiovendae* C. E. Gust., 185.

Rubus dictyophyllus Oliv., 179.
 — *Doggettii* C. H. Wright, 178.
 — *Ecklonii* Focke, 180.
 — *elongatus* Sm., 181.
 — *exsuccus* A. Rich., 181.
 — *Friesiorum* C. E. Gust., 177.
 — — var. *elgonensis* C. E. Gust., 178.
 — — var. *Hageniae* C. E. Gust., 178.
 — *Gardnerianus* O. Kuntze, 281.
 — *glomeratus* Bl., 281.
 — *inedulis* Rolfe, 186.
 — *intercurrens* C. E. Gust., 186.
 — — var. *confluens* C. E. Gust., 186.
 — *interjungens* C. E. Gust., 181, 182.
 — *iringanus* C. E. Gust., 184.
 — *kingaënsis* Engl., 184.
 — — var. *pubescens* C. E. Gust., 184.
 — *kirungensis* Engl., 184.
 — — var. *glabrescens* C. E. Gust., 184.
 — *madagascariensis* C. E. Gust., 185.
 — *myrianthus* Baker, 178.
 — *Petitianus* A. Rich., 182.
 — *pinnatus* Willd., 182.
 — — var. *afrotropicus* Engl., 183.
 — — forma *glaber* C. E. Gust., 183.
 — — forma *subglandulosus*, C. E. Gust., 183.
 — *Quartinianus* A. Rich., 185.
 — — var. *Pappianus* C. E. Gust., 185.
 — *rigidus* Sm., 185.
 — — var. *huillensis* Focke, 186.
 — — var. *incisus* C. E. Gust., 186.
 — — var. *Mundtii* Focke, 186.
 — — forma *lachnocarpus* C. E. Gust., 186.
 — *rungwensis* Engl., 184.
 — *runssorensis* Engl., 178.
 — *Scheffleri* Engl., 183.
 — *Steudneri* Schweinf., 179.
 — — var. *aberensis* Engl., 179.
 — *Stuhlmannii* Engl., 183.
 — — var. *aberdarensis* C. E. Gust., 183.
 — *transvaliensis* C. E. Gust., 185.
 — — var. *kyimbilensis* C. E. Gust., 185.
 — *ulugurensis* var. *apricus* C. E. Gust., 180.
 — *Volkensii* Engl., 178.

Rudgea Freemanii Sprague et Williams, 365.
Ruellia fulgida Andr., 372.
 — *Galeottii* Leonard, 59.
 — *oaxacana* Leonard, 60.
 — *spissa* Leonard, 61.
Rustia pauciflora Solereder, 363.

S.

Salacia amentacea Ridley, 239.
 — *Bartlettii* Ridley, 239.
 — *Beccarii* Ridley, 238.
 — *castaneifolia* Ridley, 241.
 — *flavescens* Kurz, 237.
 — *Klossii* Ridley, 240.
 — *latifolia* Wall., 237.
 — *leucoclada* Ridley, 239.
 — *litseifolia* Ridley, 240.
 — *megasperma* Ridley, 237.
 — *minutiflora* Ridley, 238.
 — *prinoides* DC., 237, 240.
 — *sphaerocarpa* Rusby, 358.
 Sampson, H. C., 350.
 Sandwith, N. Y. Contributions to the flora of tropical America : xxxvii.
 Notes on the flora of Tobago, 353.
Santaloides cordatum Schellenb., 275.
 — *floridum* O. Kuntze, 275.
 — *Havilandii* Schellenb., 275.
 — *ovale* Schellenb., 275.
 — *simplicifolium* O. Kuntze, 275.
Saraca elegans Ridley, 278.
 — *Hullettii* Prain, 278.
 — *longistyla* Ridley, 279.
 Sarawak, 1932, Convolvulaceae collected by the Oxford University Expedition to, 175.
Saussurea Chapmanii C. E. C. Fischer, 287.
Schaueria Hassk., 189.
 — *graveolens* Hassk., 192.
Schoenobiblus grandifolia Urb., 375.
Scleria latifolia Sw., 381.
 — *pterota* Presl, 381.
Secamone siamica Kerr, 448.
Securidaca corymbosa Turcz., 115.
Selinum Petroselinum E. H. L. Krause, 257.
 Senecio from Argentina, two new species of, 197.
 — *Comberi* Cabrera, 197, 198.
 — *neuquensis* Cabrera, 199.
 — *nudicaulis* Ham., 295.
Sequoia gigantea var. *pendula* Lavallée, 86.
 — *Wellingtonia* var. *pendula* M. L. Green, 86.
Setaria barbata Kunth, 383.

Setaria paniculifera Fourn. ex Hemsl., 383.
 Seventh international botanical congress, Stockholm, 400.
Siagonarrhen Mart. ex J. A. Schmidt, 189.
 Siam, contributions to the flora of, 24, 98, 127, 199, 445.
Sida acuta Burm., 356.
 — *antillensis* Urb., 356.
 — *glomerata* Cav., 356.
 — *linifolia* Juss., 356.
 — *retusa* Linn., 221.
Sideritis glandulifera Post, 466.
 — *perfoliata* Linn., 466.
Silene Behen Linn., 464.
Silene maritima and *S. vulgaris*, researches on, 248.
Siler cordifolium Boiss., 465.
 Sindora, a note on certain Malayan species of, 73.
Sindora Echinocalyx Prain, 75.
 — *intermedia* Prain, 75.
 — *parvifolia* Backer ex Heyne, 77.
 — *parvifoliola* Symington, 77.
 — *velutina* Baker, 77.
 — *Wallichii* Benth., 75.
 — — var. *intermedia* Baker, 75.
 — — var. *ovalifolia* Maingay, 75.
 — — var. *siamensis* Baker, 75.
Sipolisia lanuginosa Glaziov ex Oliv., 300.
 Sixty years of botany (review), 215.
Sloanea javanica Bl., 229.
Smilax cumanensis Willd., 380.
 Soiless growth of plants (review), 314.
Solanum dolichostylum O. E. Schulz, 369.
 — *lanceifolium* Jacq., 369.
 — *nigrum* var. *americanum* O. E. Schulz, 369.
 — *scabrum* Vahl, 369.
 — *Seaforthianum* Andr., 369.
Solenospermum apiculatum Ridley, 235.
 — *aquatile* Ridley, 236.
Sonerila Barnesii C. E. C. Fischer, 35.
Sophora occidentalis Linn., 359.
 — *tomentosa* Linn., 359.
 South India, new or little known plants from, 32.
Spatholobus littoralis Hassk., 277.
 — *persicinus* Ridley, 278.
Spegazzinia Backeb., 300.
Sphenodesme ferruginea Briq., 442.
 — *involutrata* Robinson, 441.
 — *mekongensis* Dop, 441, 442.
 — *microstylis* C. B. Clarke, 441, 442.

Sphenodesme mollis Craib, 441, 443.
 — *odorata* Fletcher, 207, 441, 442.
 — *orbicularis* Fletcher, 208, 441, 442.
 — *pentandra* Jack, 441, 442.
 — *triflora* Wight, 441, 442.
 — *unguiculata* C. B. Clarke, 441.
Sphyrospermum buxifolium Poepp. et Endl., 367.
Spilanthes uliginosa Sw., 366.
Sporobolus virginicus Kunth, 382.
 Sprague, T. A., and Bullock, A. A. *Penstemon campanulatus* and *P. Kunthii*, 1.
 Sprague, T. A., and Green, M. L. The botanical name of the Douglas fir, 79.
Stachytarpheta indica Vahl, 411.
 — *jamaicensis* Vahl, 411.
Stenandrium mexicanum Leonard, 62.
Stephanotis pilosa Kerr, 453.
Sterculia arachnifera Ridley, 223.
 — *bicolor* Mast., 222.
 — *borneensis* Ridley, 224.
 — *campaniflora* Ridley, 224.
 — *cuspidella* Ridley, 224.
 — *Hewittii* Ridley, 222.
 — *laevis* Wall., 222.
 — *huzonica* Warb., 222.
 — *pallidiflora* Ridley, 223.
 — *rhodifolia* Stapf ex Ridley, 222.
 — *Scortechinii* King, 222.
 — *subpeltata* var. *velutina* Ridley, 222.
 Stockholm, seventh international botanical congress, 400.
 Stoker, F. A gardener's progress (review), 351.
Strychnos innocua Del., on the synonymy and distribution of, 45.
Strychnos alnifolia Baker, 47.
 — *Behrensiana* Gilg et Busse, 47.
 — *Burtoni* Baker, 47.
 — *dschurica* Gilg ex A. Chev., 49.
 — *dysophylla* Benth., 47.
 — *innocua* Del., 46.
 — — var. *pubescens* Solered., 46.
 — *Lokua* A. Rich., 47.
 — *penduliflora* Baker, 49.
 — *Quaqua* Gilg, 47.
 — *randiiformis* Baill., 47.
 — *spinosa* Lam., 49.
 — *triclisioides* Baker, 47.
 — *Unguacha* A. Rich., 46.
 — — var. *dschurica* Gilg, 46.
 — — var. *dysophylla* Gilg, 46.
 — — var. *grandifolia* Gilg, 46.
 — — var. *micrantha* Gilg, 47.
 — — var. *microcarpa* Gilg, 47.

Strychnos Unguacha var. *obovata* De Wild., 47.
 ——— var. *polyantha* Gilg, 47.
 ——— var. *Steudneri* Gilg, 47.
 ——— var. *retusa* Chiov., 47.
 ——— *xerophila* Baker, 47.
Stylogyne lateriflora Mez, 367.
 Sudan, horticultural appointments in the, 133.
 Summerhayes, V. S. African orchids, 141.
 ——— Notes on the flora of Tobago: Orchidaceae, 377.
 Swahili plant names (review), 87.
 Swaney, M. W., and Ellis, C. Soilless growth of plants (review), 314.
Swertia Lacey Craib, 211.
 Symington, C. F. A note on certain Malayan species of *Sindora*, 73.
Symphorema involucreatum Roxb., 441.
 ——— *Jackianum* Kurz, 441, 442.
 ——— *unguiculatum* Kurz, 441.
Symplocos spectabilis Brand, 295.
Synedrella nodiflora Gaertn., 366.
 Synopsis of the Labiatae of the Guianas, a, 187.

T.

Tabebuia glomerata Urb., 372.
 ——— *rufescens* J. R. Johnston., 373.
 ——— *serratifolia* Nichols., 372.
Tabernaemontana citrifolia Jacq., 368.
Tarrietia albiflora Ridley, 225.
 Taxonomic position of *Tetrathalamus*, the, 458.
Tectona grandis Linn. fil., 415.
Tephrosia candida DC., 276.
Teramnus labialis Spreng., 359.
Terminalia borneensis Ridley, 283.
Ternstroemia aneura Miq., 174.
 ——— *Beccarii* Stapf ex Ridley, 174.
 ——— *citrina* Ridley, 173.
 ——— *denticulata* Ridley, 174.
 ——— *Hosei* Ridley, 174.
 ——— *japonica* var. *denticulata* Pierre, 176.
 ——— *magnifica* Stapf ex Ridley, 175.
 ——— *oligostemon* Krug et Urb., 356.
Tetrapteris discolor DC., 357.
Tetrathalamus, the taxonomic position of, 458.
Tetrathalamus Lauterbach, 458.
 Textbook of general botany, a (review), 351.
 Thompson, H. N. (obit.), 303.
 Three new species from Tibet, 285.
Thymus biserratus Blanco, 195.

Tibet, three new species from, 285.
Tillandsia bulbosa Hook., 379.
 ——— *usneoides* Linn., 379.
 ——— *utriculata* Linn., 379.
Tithymalus Mill., 468.
 Tobago, notes on the flora of, 353.
Tobagoa maleolens Urb., 365.
 Tothill, J. D., 52.
Tournefortia bicolor Sw., 368.
 ——— *hirsutissima* Linn., 368.
 ——— *Roxburghii* C. B. Clarke, 296.
Toxocarpus lagenifer Kerr, 449.
 ——— *oblanceolatus* Kerr, 450.
 ——— *ovatus* Kerr, 450.
Trachelospermum anceps Dunn et Will., 295.
 ——— *auritum* Schneid., 210.
Tradescantia geniculata Jacq., 380.
 ——— *multiflora* Sw., 380.
Tragia volubilis Linn., 376.
Trema micranthum Bl., 376.
Tresanthera condamneoides Karst., 363.
 ——— *pauciflora* K. Schum. ex Solereder, 363.
Trichodesma sinicum Brand, 296.
Trichomanes crispum Linn., 383.
 ——— *polypodioides* Linn., 383.
Trichostigma octandrum H. Walt., 374.
Trifolium pratense Linn., 464.
 ——— *subterraneum* Linn., 464.
Trimezia martinicensis Herb., 379.
Triumfetta pseudo-cana Sprague, 229.
 Tropical America, contributions to the flora of, 292.
Tunica Kennedyae A. K. Jackson et Turrill, 462.
 Turrill, W. B. Ecological isolation, 384.
 ———, and Jackson, A. K. Additions to the flora of Cyprus, 460.
 ———, and Marsden-Jones, E. M. Researches on *Silene martima* and *S. vulgaris*: xxi. Further research on the genetics of anthocyanin and other characters in *S. martima*, 248.
Tussacia pulchella Reichb., 371.
Tylophora riparia Kerr, 451.

U.

Uraria lagopodioides DC., 277.
Urena lobata Linn., 221.
 ——— var. *scabriuscula* DC., 221.
 ——— var. *tomentosa* DC., 221.
Urera baccifera Linn., 376.

Urera caracasana Gaud., 377.
Unguacha Simiarum Hochst., 46.

V.

Vallaris anceps C. E. C. Fischer, 295.
— *arborea* C. E. C. Fischer, 295.
Vanilla heterolophia Summerhayes, 149.

Verbena officinalis Linn., 410.

Vernonia blanda DC., 210.

— *cylindriceps* C. B. Clarke, 295.

— *scorpioides* Pers., 365.

Vernonieae collected by Glaziou in
Brasil, four new species of, 298.

Viburnum atro-cyaneum C. B. Clarke, 210.

Vicia lathyroides Linn., 465.

— *tibetica* C. E. C. Fischer, 285.

Vigna lutea A. Gray, 277.

Viola Kitaibeliana Roem. et Schult., 461.

— *occulta* Lehm., 461.

Vitex Agnus-castus var. *trifolia* Kurz, 432.

— *canescens* Kurz, 431, 433.

— *coriacea* C. B. Clarke, 431, 434.

— *gamosepala* Griff., 432, 436.

— *glabrata* R. Br., 432, 435.

— *heterophylla* Roxb., 432, 434.

— var. *typica* H. J. Lam, 434.

— var. *undulata* C. B. Clarke, 422, 434.

— *involutatus* Presl, 441.

— *leucoxydon* Linn., 436.

— *limoniifolia* Wall. ex Kurz, 431, 433.

— *longisepala* King et Gamble, 432, 436.

— *Negundo* Linn., 431, 433.

— *ovata* Thunb., 432.

— *peduncularis* Wall. ex Schauer, 432, 436.

— *Pierrei* Craib, 431, 433.

— *pubescens* Vahl, 432, 435.

— *quinata* Williams, 432, 434.

— *repens* Blanco, 433.

— *siamica* Williams, 432, 435.

— *sumatrana* var. *urceolata* King et Gamble, 432, 434.

— *trifolia* Linn., 431, 432.

Vitex trifolia var. *ovata* Makino, 431, 432.

— — var. *repens* Ridley, 433.

— — var. *unifoliolata* Schauer, 432.

— *urceolata* C. B. Clarke, 434.

— *vestita* Wall. ex Kurz, 432, 436

W.

Walker, E. H., and Merrill, E. D.
A bibliography of Eastern Asiatic
botany (review), 310.

Waltheria americana Linn., 356.

Wellingtonia gigantea var. *pendula*
Carrière, 86.

West, J. A preliminary list of plant
diseases in Nigeria, 17.

Winteraceae, the genus *Tetrathalamus* included in, 459.

Wissadula periplocifolia Thw., 221.

X.

Xanthophyllum glabrescens Ridley, 113.

— *Hosei* Ridley, 113.

— *molle* Ridley, 114.

— *pallidum* Ridley, 113.

— *purpureum* Ridley, 114.

Xanthosoma Jacquini Schott, 380.

Xiphidium caeruleum Aubl., 379.

Xylocarpus, notes on, 288.

Xylocarpus australasicus Ridley, 291.

— *benadiensis* Mattei, 288.

— *Forstenii* Miq., 291.

— *gangeticus* Parkinson, 291.

— *Granatum* Koen., 288.

— *guineensis* Roem., 292.

— *mekongensis* Pierre, 291.

— *minor* Ridley, 289.

— *moluccensis* Roem., 288, 291.

— *parvifolius* Ridley, 290.

— *procerus* Steud., 292.

— *touloucouna* Steud., 292.

Z.

Zahlbruckner, A. (obit.), 304.

